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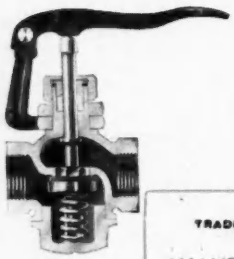

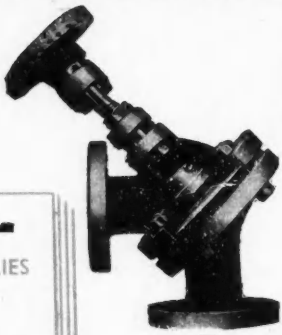

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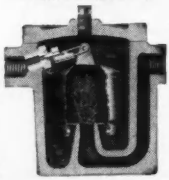

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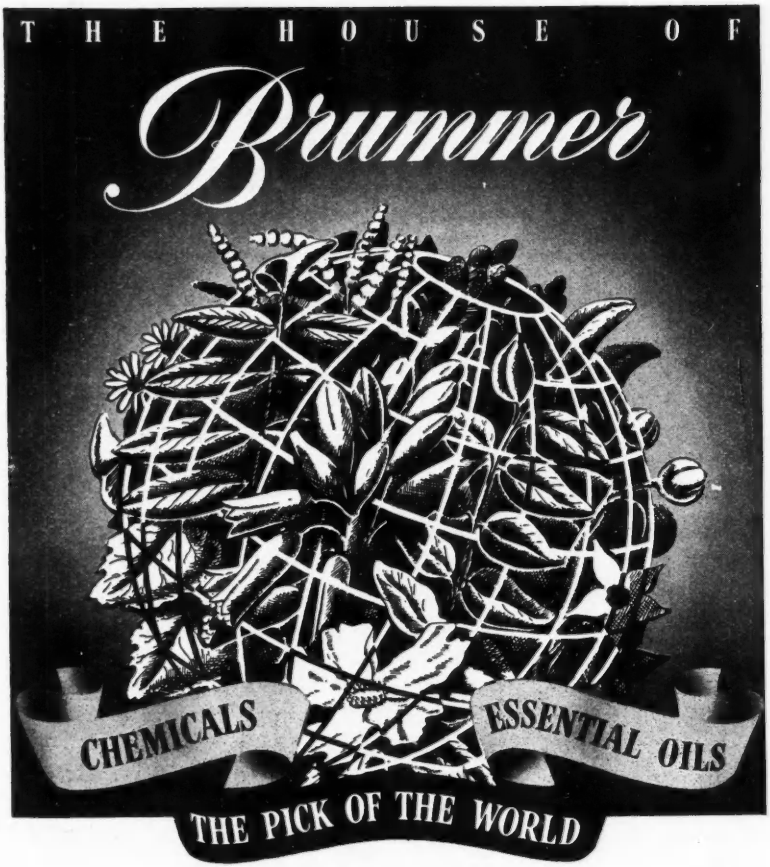

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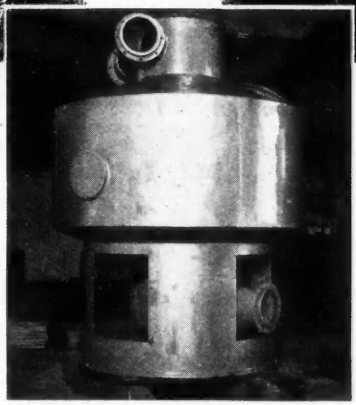

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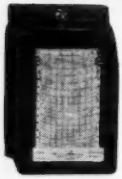

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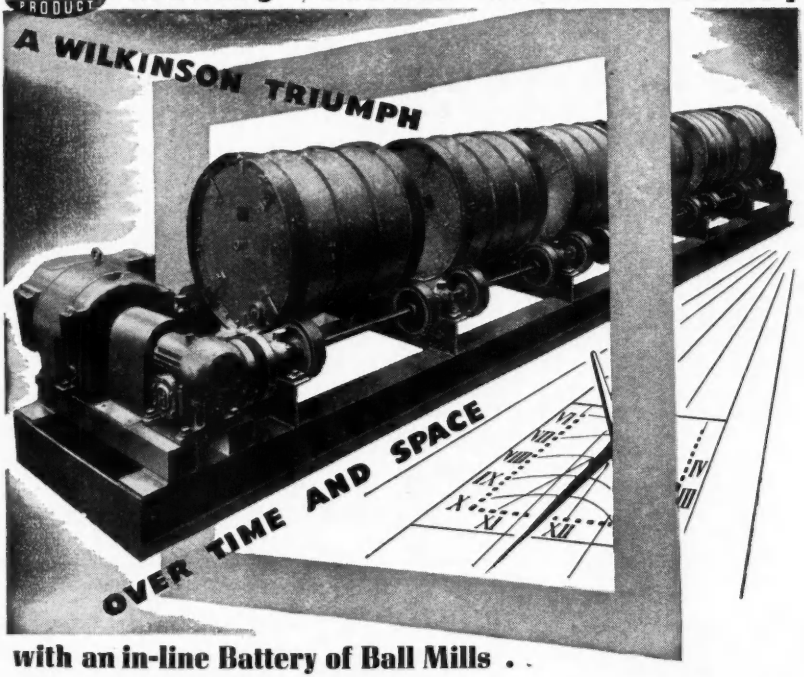

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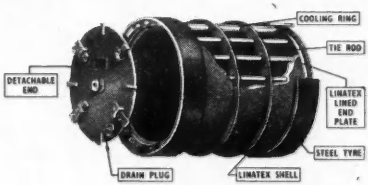

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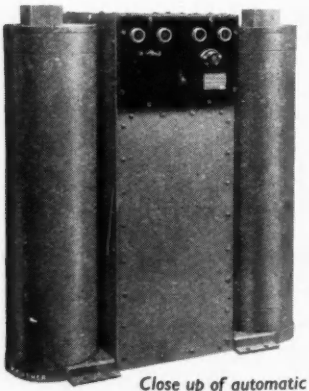

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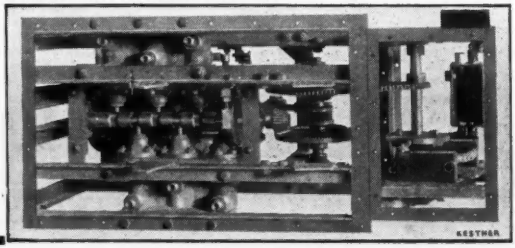

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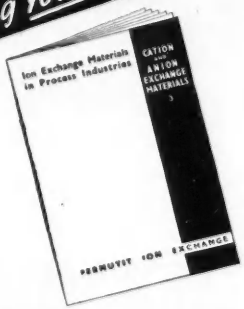

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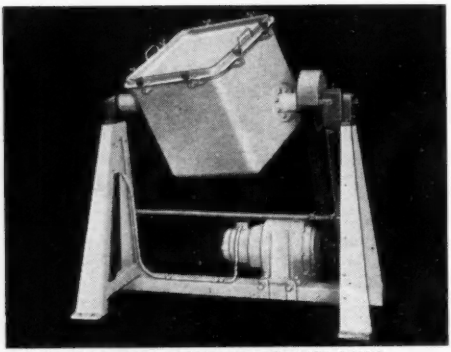

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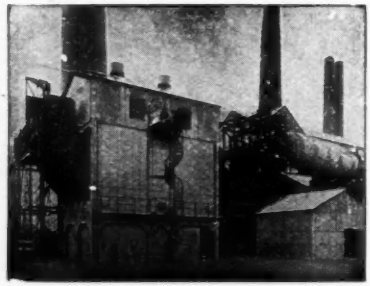

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Seeking a Code

THERE is manifestly a growing disquiet among scientists in many widely differing fields of activity which has its roots in the knowledge that the results of their work are prone to have rapid—and sometimes terrible—results on humanity at large. The ivory tower, in a word, is no longer a defendable position, and in the observations of more than one chemist of distinction at the 67th meeting of the Society of Chemical Industry in Edinburgh last week recognition of this situation was made or implied.

This is all the more significant because it reflects the acceptance in the particular sphere of industrial chemistry the challenge to which some tentative replies have been made here and there in a very much wider field. It recalls, for example, the fact that at a meeting of a committee of a body known as the "International Council of Scientific Unions" in Paris a week or two before, there was adopted a "Charter for Scientists," and it was stated that the committee urged that this charter should be regarded as the scientists' "Hippocratic Oath." The Hippocratic school, although it practised much that is now obsolete, embodied in its literature a code of teaching and principles that are surprisingly modern and the oath which derived from Hippocrates has been adopted as a pattern by medical men throughout the ages. The physician swears first to give allegiance to his teacher, to succour his family if they should be in need and to instruct in his turn all students who have taken the oath. He declares that he: "Will use treatment to help the sick according to my ability and judgment but never with a view to injury and wrongdoing. Neither will I administer poison to anyone when asked to do so, nor will I suggest such a course."

The principles contained in those passages (according to Guthrie's "History of Medicine") are sufficiently universal in their application to embrace many of the arts and sciences, and a general acceptance of the pledge by many scientists might be widespread were there not in the concluding lines an undertaking to which strictly contemporary conditions have lent a controversial character. It adds: "And whatsoever I shall see or hear in the course of my profession in my intercourse with men, if it be what should not be published abroad, I will never divulge, holding such things to be holy secrets." There are variants of the wording, but the sense cannot be mistaken.

The International Council of Scientific Unions does not appear to have any clear claim to speak for scientists in the matter of their professional conduct. Nevertheless, the charter which it adopted is worth examining in the light of the current need for guidance. It starts by recalling that the prominence of science in modern society causes scientists to have special obligations, over and above the normal duties of citizenship. Its intention is to assert that scientists should regard themselves as citizens of the world rather than

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as having a prior allegiance to their own country—international bodies commonly belittle national obligations! The scientist, it is noted, often secures special information not available to the ordinary citizen. The "Charter" then proceeds in these terms: "It thus becomes the duty of the scientist to: (a) maintain a spirit of frankness, honesty, integrity and co-operation, and to work for international understanding: (b) consciously examine the meaning and purposes of the work that he or she is performing; (c) inquire into the purpose for which the work is being done and the moral issues that may be involved; (d) promote the development of science in the way most beneficial to mankind and exert his or her influence as far as possible to prevent its misuse; (e) assist in the education of the people and the government in the purposes and the achievements of science."

The charter then goes on to assert that "in order to fulfil these obligations, it is necessary to claim certain rights for scientists, the principal ones being: (i) freedom of publication and the utmost freedom to discuss one's work with other scientists; (ii) economic security and the right to participate freely in all activities permitted to all citizens; (iii) the possibility of obtaining information about the purposes for which his or her work is being done."

Those who framed this charter quite evidently had in mind the increasing use of science for military ends. We are all on the side of those who would call a halt to this process of increasing the potential of destruction. But unless we can be confident that every scientist in every nation, regardless of possible persecution, can be relied upon not to do work that can be used for military ends, the charter will be no more practical than other attempts made to outlaw war. If a dictator country uses science for warlike preparations, and the democracies refuse to do so—democracy might be doomed. It is the strong, not the meek, who to-day inherit the earth. Much as one must sympathise with the apparent objectives of the charter, it is hard to have much confidence in the means proposed.

The work of most scientists is not primarily nor even secondarily connected with war-like preparations. Many scientists are engaged in pure research or teaching. To them, the charter might be applied without any grave difficulty. The majority of scientists, however, are engaged in industry, and this charter seems at direct variance with the Hippocratic Oath which it is intended to simulate. The Hippo-

(*Continued on page 106*)

NOTES AND COMMENTS

Northern Migrants

THE oft-repeated Scots lament that all their best scientists vanish like Autumn swallows to the South seemed to have been completely discountenanced by the evidence at the many scientific and social meetings of the Society of Chemical Industry in Edinburgh last week. Not only did the convention bring to Scotland the very willing attendance of some of the most distinguished figures in science South of the Tweed, but the scientific quality of those who were the hosts, actually or territorially, left no doubt that science in Scotland suffers from no scarcity of intellect. Nearly all the papers presented in fact did honour to Scottish chemical industries or to Scottish authors. It was a great week for the Scots and for their English guests a most memorable experience of stimulating intellectual contacts and of the warmest sort of fellowship, in a city which might have had its origin in the material re-creation of a fairy tale. The possible choice of Manchester as the location of the annual meetings in 1949 will enable some of the new northern contacts made last week to be renewed.

The State and the Scientist

THE reflections in Edinburgh of the workings of scientific minds were not entirely confined to the immediate objectives of industrial chemistry. The SCI, as in the past, is very well equipped to see the wood despite the multiplicity of the trees, and the lively outspokenness of its immediate past-president, Dr. Leslie Lampitt allowed it no excuse for evading the larger issues. It was perhaps not merely by coincidence that two of the principal contributions on Tuesday and Wednesday presented conflicting views on a subject which circumstances are forcing more and more into the foreground: the increasing concentration of scientific work in the hands of the State. The evidence of this was very fully presented, although not in a spirit of criticism, by Sir John Anderson in his review of the great growth of the responsibility for basic and applied research the Government has assumed since the 1918 war. Sir John's only criticism seemed to be that these developments had not kept pace with requirements and that much more would be required to approach the scale of State or sponsored research in the U.S.A. One verdict on this seemed to have been prepared, before the summing up, by Dr. Lampitt, who, opening the 67th session, gave his own views on State-aided research—"almost menacing." More and more scientists, he declared, were involuntarily becoming Civil Servants and, excluding those of the largest industrial groups, private research institutions were losing their independence. The whole trend, he declared, was to treat all research by bureaucratic standards in the light of its immediate utility and to discredit fundamental research and the individual investigator. Dr. Lampitt's verdict on the many "Leftish intellectuals" he discerns among the ranks of scientists was characteristic: "They plan for planning's sake and not for the good of the community. They have a high natural volatility and a low intellectual flash point."

Costly Coal

A CONSPICUOUS but not particularly surprising omission from the presentation to the House of Commons of the National Coal Board's report and accounts for 1947 is of any direct reference to the fundamental cause of the loss of £23.25 million on the year's coal raising and trading. A number of the more obvious factors which have rendered coal expensive and not over plentiful are arrayed and it is admitted that the cost of production rose by 4s. 3d. per ton, of which 2s. 6d. was directly attributable to increased wages and benefits to miners. That relates only to 1947, when the Board sought to obtain from industry a substantially higher price and was deterred by the Minister, no doubt on grounds of political, as much as economic, expediency. Instead, the policy of gradualness was preferred and the result has been that since last Autumn the price of coal to consumers has risen by 6s. 6d a ton, imposing an additional burden on users of some £60 million a year.

A Poor Return

THE results of this coal price spiral have inevitably been manifested in the discouragingly high price levels of

most of the country's industrial output and more directly in the higher cost of nearly all the great range of coal-derived chemicals, which only their essential character has rendered endurable. The underlying trouble, which the report showed no disposition to tackle, is, of course, the inadequacy of the return made by the individual coal face worker for the great improvements in conditions and wages, the latter last year averaging in some areas over £9 8s. a week and (in South Derbyshire) over £10 2s. in the last quarter. Overall production of deep mining did in fact improve from 1.03 tons (in 1946) to 1.07 tons per manshift, but when this is seen in relation to the figure quoted by the Reid report as a comparable example—1.11 tons in the Ruhr in 1932—the achievement, with much more mechanisation and more ample manpower, is not impressive. High wages are admirable just so long as productivity keeps pace with them. In the mines it has not and this has contributed in no small degree to the inflationary conditions which the Government is pledged to combat, yet seems incapable of preventing in one of the departments which have become entirely its own responsibility.

Lifting the Curtain

"THE CHEMICAL AGE," writes a correspondent, "must be the most influential journal in the world. It publishes an editorial calling for relaxation of the restriction of imports of foreign scientific literature . . . and next day the impediment is removed. . . !" How refreshing it would be if it was in fact as easy as that, or if the Board of Trade's "Notice to Importers No. 293" enabled one to buy whichever foreign scientific periodical one desired at the moment. This, of course, it does not, and the best that can be said for it is that it does permit a wholesaler to negotiate the supply to specified readers of periodicals "of learned, scientific, technical or religious nature" as single copies through the post, without opening wide the gate to the inept pornography and equivalent rubbish—unless it is in a foreign tongue—on which overseas currency was formerly wasted. The "concession" would have been received even more cordially had it not been announced in the grudging terms associated with the withdrawal of an ill-considered and harmful restriction: "The Import Licensing Department are not prepared to answer any inquiries as to whether any particular periodical, etc., comes within the categories defined by sub-paragraph (1) (" of a learned, etc., nature or printed exclusively in a foreign language "). . . . Any abuse of the concession . . . may result in the withdrawal of the authorisation to make arrangements for payment."

Atomic Exhibition to go Overseas.—During its tour of 25 of the main centres in England, Scotland and Wales, the atomic energy exhibition train was visited by over 146,000 persons, with an average number per full day of about 1000, or 80 per cent of the train's capacity. Dr. J. Rotblat, of the physics department, University of Liverpool, who had a large share in the organisation of this enterprise by the Atomic Scientists' Association, said the council of that body, as well as the Ministry of Supply and other owners of equipment have agreed to lend all the exhibits to Unesco and the Lebanese Government for display at the Beirut Conference in October. Later they will probably tour several countries in the Middle East.

SEEKING A CODE

(*Continued from page* 104)

cratic Oath enjoins secrecy upon the practitioner in regard to matters which "should not be published abroad." The Charter for Scientists, on the contrary, enjoins the scientist to pry into the whys and wherefores of the work he is doing and to publish it abroad. Industry cannot allow complete freedom of publication, particularly if the scientist is also fully informed about the purposes for which his work is done. If the charter is intended only to "humanise" military action it is very restricted in its application, and cannot by any means be held to be the scientists' Hippocratic Oath—the name that its authors have bestowed upon it.

A true Charter for Scientists in this wider sense must embody the scientific worker's code of moral practice in *all* aspects of his work. Hippocrates did his work far better than the Committee of the International Council of Scientific Unions have done theirs. Whatever is recommended for acceptance by scientists as a whole must be theoretically and morally unimpeachable, and capable of being put into practice.

Press Visit to Harwell

No Quick Source of Energy

THE partial raising of the rigid "security" regulations which have shrouded much of the activity of the Atomic Energy Research Establishment at Harwell was made on Wednesday, when a party of Press representatives, selected by a lottery, was conducted round the establishment and enabled to see the new British experimental pile (Bepo), which in a few months will be generating 6000 kW. This will then be the means of providing most of the radioactive isotopes for medicine and other uses within the Commonwealth.

Sir John Cockcroft, director, discouraged any unduly optimistic views of rapid application of nuclear processes, telling the party that no serious person in that field of research believed that nuclear energy would make any contribution to world power during the next decade. "First," he said, "we must solve the so-called breeding problem—we must be able to burn up the greater part of the uranium by making the primary fuel U235 breed secondary fuel from U238, or thorium. Secondly, we must solve the metallurgical problem of finding materials which will stand high temperatures and be suitable for use in pile construction. Thirdly, we must develop an efficient way of processing nuclear fuel which has been used in piles. Fourthly, we have to be able to dispose of the large amount of radioactive ash which would be produced by world power stations operating on nuclear fuel."

PHOSPHATE INSECTICIDES

COMMENTING on the difficulties encountered in the more general use of arsenic insecticides (THE CHEMICAL AGE, July 17), Albright & Wilson, Ltd., states that fruit and vegetable growers are showing considerable interest in the organic phosphates being developed as insecticides. Control of aphides and mites has always presented special problems and extended field trials of these new chemicals show them to be particularly suitable for this purpose. Hexaethyl tetraphosphate (HETP) is now being used on a commercial scale and has proved most effective against green fly, black fly, woolly aphis, red spider and other pests.

HETP is toxic and requires careful handling, but breaks down in water to give harmless residues so that crops may be eaten 48 hours after spraying. The demand both at home and overseas is increasing, but, as plant at the company's Oldbury works is capable of turning out several hundred tons a year, supply is assured.

Control of U.K. Imports

Effect of BoT Order No. 292

CONTROL of imports into the U.K. is the subject of Notice to Importers No. 292, which appears in full in the *Board of Trade Journal*, July 17. Since March, 1947, when Notice to Importers No. 242 was issued, certain changes have occurred. In so far as they are still operative, they have been incorporated into Notice No. 292.

Chemicals and allied materials entering the U.K. are included under appendices I, II, III, and VI. Details are as follows:—

Appendix I—Materials which can be imported from any country without separate licences: Bauxite, cobalt oxide (crude and refined), crude cobalt-iron-copper alloy, and cryolite (natural and refined).

The following drugs and similar materials are included: Aconite, aloes (Cape, Curaçao), socotrine, araroba, arnica flowers and rhizome, asafoetida, balsam of copaiba, balsam of Peru, balsam of tolu, camomile flowers, cascara bark, cascarilla bark, ispaghula, jaborandi, kamala, kino, krameria, liquorice root (natural and peeled), mastic gum, nux vomica, orris root, cassia fistula pods, chaulmoogra oil, eucalyptus red gum, dandelion root, colocynth pulp or apples, croton seeds, ephedra herb, euphorbia (gum and herb), gentian root, gualacum gum, Egyptian henbane, hydnocarpus oil, papain, podophyllum emodi, senna (leaves and pods), stramonium, and valerian root.

The following dry earth colours: Ochres, siennas and umbers.

Felspar including china stone, fireclay, flint (unground).

The following gums and resins: Arabic, damar, kauri, myrrh, olibanum, sandrac, and tragacanth.

Gypsum (unburnt, including alabaster).

The following herbs (dried, in bulk): Basil, bay leaves, marjoram, parsley, pennyroyal, rosemary leaves, savoury leaves, tarragon, and thyme.

Ilmenite, kyanite, nickel ores (concentrates and residues), pandermite, peat moss, peat moss litter, dustor mould, granulated peat, and peat fuel or tailings, seaweed (raw, unground, dried or bleached (not further prepared or treated), shellac, sillimanite, slag (other than basic).

Appendix II—Goods which may be imported without separate licence if consigned from the British Commonwealth: Tin (blocks, ingots, bars and slabs).

Appendix II relates to goods imported without separate licences if consigned from Eire. Items listed here include bog ore, clay, compressed gases, flax tow and waste (excluding flax straw), hydrocarbon oils, iron pyrites, distempers, dry earth colours, paints, enamels, varnishes, lacquers, etc., pigments, extenders, metallic powders (excluding aluminium powder), rock crystal quartz, and yeast.

Appendix VI—Goods requiring separate transhipment licences: All edible and non-edible oils and fats, all oil-bearing seeds; soap.

Coal Plans—and Absentees.—The possibility of future substantial coal production in the North-East was referred to by Maj.-Gen. Sir Noel Holmes, chairman of the divisional board, announcing last week that it was planned to spend in the next 10 years £35.44 million, largely on equipment. It was estimated the division's output could be raised to 53 million tons annually by 1958. The present total of 875,000 tons could have been raised to 1 million tons, but for absentees (17.4 per cent of coal face workers).

Royal Institute of Chemistry

Members Visit Whale Factory Ship

A PARTY of 17, including the chairman, hon. secretary and two members of the Newcastle Section of the Royal Institute of Chemistry, recently visited the *Southern Venturer*, 21,000-ton whale factory ship, at South Shields.

The visitors travelled down the Tyne from Newcastle in the tug *Great Emperor* and were met at the docks by Mr. Russell Little, manager of the Middle Docks & Engineering Co., Ltd., at South Shields, who, with Mr. Camilleri, of the company's London office, had made all the arrangements for the visit. The guests were conducted over the ship by Mr. Reynolds, chief engineer, Dr. Downing, chief chemist, and Mr. Wolstan, a member of his staff. With its sister vessel, *Southern Harvester*, the factory ship had just returned from a seven months' whaling season in the Antarctic, during which time it created a record by producing 205,600 barrels of oil (over 40,000 tons).

Preparing the Catch

The vessel is equipped for the production of oil (blabber, sperm and liver), meat and liver meal. The whales, caught from small boats, are towed behind the factory ship until ready for dissection. They are then hauled up a slipway in the stern of the ship, and the blubber is stripped off and transferred to one of 24 rotary extractors in which steam pressure is used to extract the oil.

The heads are cut into small pieces which are also treated with hot water to recover the oil. The waste from this extraction, containing phosphates and glue, is discharged overboard and the back meat is cut and minced. Any remaining shrapnel from the harpoon is removed magnetically and the meat dehydrated. The liver is minced, dried *in vacuo* in steam-lined cylinders, and the oil extracted with trichlorethylene. The residue, which is rich in riboflavin, is packed as a meal. One whale can be dealt with in 40 minutes, and a full 24-hour day is worked.

Floating Laboratory

The vessel, besides being equipped with the necessary machinery to enable all these operations to be carried out while afloat in the Antarctic, also has a chemical control laboratory, and three chemists are included in the total complement of 370.

After the tour the visitors entertained Mr. Little, Mr. Hansen, the dock superintendent, and three members of the staff of Chr. Salvesen & Co. to lunch at the "Grotto." A vote of thanks to the organisers of the visit was proposed by Mr. McLachlan, hon. secretary of the London and South Eastern Counties Section of the Institute, seconded by Mr. W. Gordon Carey, chairman of the Newcastle Section. Mr. Little responded in suitable terms. Mr. McLachlan also expressed the pleasure of the visitors from London in having the company of the representatives of the Newcastle Section on this occasion.

Further Visits

Members of the London and South Eastern Section also paid a visit recently to the National Institute of Research in Dairying at Shinfield where they were conducted by Dr. Kon through the physiological, nutrition, chemistry and bacteriological departments. After taking tea in the Institute premises they concluded their tour by visits to the artificial insemination centre and the library.

In addition, a party of 19 members toured the Shell Haven refinery recently.

DUST SUPPRESSION

THE suppression of dust in North Wales pits—vital to increased production and to conquer the scourge of silicosis—is being tackled by the National Coal Board. A North Wales Area official has stated that a large number of the coal cutting machines had been fitted to spray the coal face with water. In the past conveyor loading points had always been clouded with intense dust. In most cases this had been entirely altered by the spraying of the coal as it drops from the conveyor into the tubs.

Experiments had been made in road consolidation—the treating of roads with hygroscopic chemicals—particularly calcium chloride—to keep them in a permanently moist condition.

Copper Output in Russian Zone

The largest single mining enterprise in the Russian zone of Germany is the former Kupfer & Schiefer Bergbau A.G., Mansfeld, which, since 1947, has been operated by the civic authorities of Sachsen-Anhalt, and receives an annual subsidy of 39 million marks. The company, which employs at present some 12,000 workers, had a 1938 output of about 28,800 metric tons per annum, equal to about 80 per cent of German production. The following by-products were produced last year (in kilogrammes): gold 15, platinum 2, silver 34,000. In addition, 155 tons of nickel sulphate and 8172 tons of sulphuric acid were produced.

HOME-PRODUCED CARBON BLACK?

Reported U.S. Schemes for Liverpool Area

THE prospect that the manufacture of carbon black may begin in the U.K. in the near future seems to have been brought nearer by statements circulating in the Liverpool area at the beginning of this week. These asserted that preliminary arrangements had been made for the production of carbon black in a big factory to be established on the Kirby trading estate.

Named as the present sponsors of the project is the Palatine Development Co., Ltd., part control of which is exercised by Gas Consolidation, Ltd. It is understood that the U.S. oil undertaking, the Phillips Petroleum Company, will also be associated with the scheme, providing technical assistance and probably the authority to employ certain patent processes.

A number of development areas are reported to have been in competition with Merseyside to obtain the American enterprise, but it is believed that when an announcement is made by the Board of Trade shortly, Merseyside will be shown to have succeeded in securing the new industry. It is stated that two American firms have suggested establishing plants in this country and a second project may follow. The first may be developed at a cost of upwards of £500,000. The larger part of the American supply of carbon black to Britain is discharged at Liverpool.

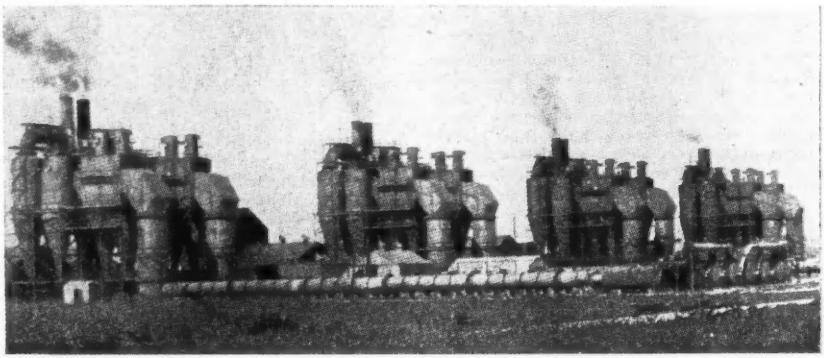
It has long been urged that British supplies of this important element in rubber manufacture, pigmentation and the making of motor tyres should be made in this country to save dollars. There have, for example, been a number of questions in the House of Commons, some of which had urged that production of carbon black should be established in the British-operated oil areas in the Middle East. The Parliamentary Secretary of the Board of Trade (Mr. J. W. Belcher) some months ago declined to disclose " information of a confidential nature regarding processes which are being considered for the production of carbon black in this country."

The need for fuller supplies was very evident in 1947 when short supplies contributed largely at one time to the scarcity of motor tyres. Post-war purchases of this essential in certain phases of rubber processing have involved large expenditure, almost entirely of U.S. dollars. The U.K., for long the principal customer for the U.S. product spent over £1.25 million for that purpose in 1946 and France was the next largest buyer. Despite the substantial dollar income represented by the sales to this and other countries, the U.S. producers have pursued a somewhat reluctant export policy, having to satisfy a mounting home demand. According to a statement issued recently by the U.S. Bureau of Mines, although carbon black production in 1947 increased 6 per cent. over the 1946 record to 7318.9 million lb., it was less than the increase in sales (over 50 million lb.) to 1319.7 million lb.

Furnace black production was greater than that of contact black for the second consecutive year—664,999 million lb. compared with 653.96 million lb. of contact types.

A gain of 47,991 million lb. in exports above the 1946 record to 319 million lb. was the

(*Continued overleaf*)



A typical installation of the kind used in the U.S. oilfields for the production of furnace blacks (*Photograph, courtesy of "CIL Oval"*)

"PROMETHEUM" AND "TECHNETIUM"

U.S. Claims to Have Isolated New Elements

CLAIMS to have adduced the first positive proof of the existence of the chemical element 43 and to have acquired the right to name element 61, by having produced the first pure samples of it, were advanced at the last symposium organised by the American Chemical Society at Syracuse, New York.

Addressing the society's national symposium on physical and inorganic chemistry, two young chemists studying at the Massachusetts Institute of Technology, Jack A. Marinsky and L. E. Glendenin, formally called upon science to change the name of element 61 to prometheum—in recognition of discoveries made possible by the atomic pile.

More than 20 years ago, it was recalled, chemists in the U.S.A. and in Italy claimed to have discovered element 61 in natural ores and proposed the names of illinium and florentium. According to two U.S. chemists, who during the war prepared the first pure samples of the artificial element while stationed at Oak Ridge, Tenn., the existence of a naturally occurring isotope of element 61 "has not been clearly established."

Should the prior claims be refuted, Messrs. Marinsky and Glendenin would have the right as discoverers to name element 61.

The Evidence

There is no doubt, say the American chemists, that element 61 was produced in the atomic pile in two ways, by purification of the products of uranium fission and by bombardment with neutrons of a little-known element called neodymium. By ion exchange, and involving a chemically active plastic powder, element 61 was isolated in a pure form.

A group of chemists from the University of Illinois, who reported the discovery of element 61 in 1926, based their claims on some unidentified lines which appeared in spectroscopic pictures of highly purified samples of neodymium, element 60, and samarium, element 62, two of the rare earths.

"The claims of these investigators have been vigorously disputed by Prandtl, who carried out a large number of similar experiments," the MIT chemists continued.

(*Continued overleaf*)

HOME-PRODUCED CARBON BLACK?

(*Continued from page 109*)

principal factor in increased total sales in 1947. Minor expansion of sales to rubber and ink manufacturers accompanied declines in sales to paint and miscellaneous industries. Of domestic sales 94 per cent went to rubber companies, 3 per cent to ink companies, 1 per cent to paint companies, and 2 per cent was used for miscellaneous purposes.

The average yield of carbon black per thousand cubic feet of gas used increased from 2.44 lb. in 1946 to 2.51 in 1946, reflecting increased production of furnace blacks which have considerably higher yields than the contact types. In all, 63 plants and 21 operators were active in 1947 compared with 60 plants and 22 operators in 1946.

While most of the carbon black used here has been derived from the natural gas produced in the U.S. oilfields, there are many other potential sources, including liquid hydrocarbons, of which there should be a more plentiful supply in the Liverpool area when the current plans for expansion of he oil refining industry come to fruition.

The methods of production most widely used in the U.S.A. were described in the last issue of the *CIL Oval* (Canadian Industries, Ltd.), which describes it as the most finely divided substance known to commerce—one lb. of carbon black is computed to have a surface area of 22 acres—and the most intensely black.

The Texas Panhandle, records *CIL Oval*, is dotted with smoky acres of galvanised sheds still operating on the older channel system. More than 100 burner sheds of a typical plant might sretch along an area 50 miles long and five miles wide. In such a plant 5 million flames burn day and night and 50 to 75 cu. ft. of gas are burned by each tip every 24 hours.

The finer quality blacks for printing inks, paints, lithograhpic inks, carbon paper and typewriter ribbons are still obtained from this process but it remains an expensive technique for only about a pound of carbon black is obtained from 1000 cu. ft. of gas.

The furnace method consists essentially of a combustion chamber, a cooling tower, an electrical precipitator and several cyclone collectors. Natural gas or higher hydrocarbons such as wild gasoline, casinghead gas, or degraded oil, and a little air are continuously fed to the furnace. The combustion forms carbon black in suspension in the gaseous by-products. The hot gases carrying the black are cooled and passed to the precipitator where the black is deposited.

"It was his contention that the occurrence of unidentified lines in the arc spectra of fractions intermediate between samarium and neodymium is not good evidence for a missing element in such a complicated region of the periodic table. Various investigators have claimed the discovery of rare-earth elements on the basis of such evidence, and have had their claims refuted."

There should be available now at the Clinton National Laboratory, Oak Ridge, relatively large quantities of one isotope of artificially prepared element 61, the speakers declared, and spectroscopic data on the synthetic element will settle definitely the validity of claims for the natural occurrance of the element, which are based on spectroscopic evidence.

"In the event that the spectral data on the synthetic element differ from those repored for the natural material, the claim of discovery by these workers must be withdrawn," declared Mr. Marinsky and Mr. Glendenin.

Proof of Element 43

The first positive proof of the existence of chemical element 43, one of the most elusive of the family elements, has been obtained through atomic research at Oak Ridge, stated G. W. Parker, James Reed, and J. W. Ruch, of the Oak Ridge Laboratory. They proposed that the element be named "technetium."

Since 1846, they said, numerous claims to have discovered element 43 have been made, and such names as ilmenium, davyum, lucium, and nipponium have been suggested—the last in connection with the work of the Japanese chemist Ogawa. None of the claims, however, stood up under subsequent investigation and number 43 remained a gap in the periodic table.

In 1925, two scientists named Noddack and Tacke reported the finding of both elements 43 and 75 which, they reasoned, would be found together in nature. They presented evidence which caused the general acceptance of the names masurium and rhenium for these elements.

Since their announcement, said the Oak Ridge investigators, rhenium had become an item of considerable commercial importance, the largest U.S. producer probably being the University of Tennessee. "The claims in respect of masurium were not confirmed by production of weighable amounts."

The next major step toward the isolation and characterisation of element 43 was taken when Professor Emilio Segre and co-workers published in the late 1930's their observations on samples of the element molybdenum (number 42), which had been bombarded with neutrons in the cyclotron. In addition to recognising some radioactive isotopes of element 43, they were able to note several of its chemical properties, and in October, 1946, Dr. Segre proposed the name technetium, with the symbol Tc.

With the advent of the Manhattan District and corresponding advances in the understanding of nuclear phenomena, it became apparent that technetium could be isolated in weighable amounts, and that two methods were available for the production of the new element. The first method was the neutron bombardment of molybdenum, and the second the chemical isolation of the new substance from the fission products of uranium.

By September, 1946, Dr. G. E. Boyd and several co-workers reported success through use of the first method and, in addition, the amounts isolated enabled them to observe several of the physical and chemical properties of the element. About the same time the Oak Ridge scientists announced the invention of a process which effectively separates from uranium and the fission products those elements which form acid-insoluble sulphides. The process was first used to isolate several milligrams of the new element.

"With a technetium source readily available, we have been able to produce samples completely radiochemically pure and with a chemical purity of approximately 99 per cent," Messrs. Parker, Reed, and Ruch said. "The beta energy and half-life have been estimated and the absorption of visible light has been investigated in our own laboratories. The direct mass assignment was recorded by Inghram and co-workers and is recorded in the open literature."

"The optical emission spectra were recorded with the aid of D. Timma in September, 1946. The X-ray emission spectra were obtained in conjunction with Burkhart, Saunders, and Peed on December 6, 1946. "It is believed that the above mentioned data comprise the first completely positive proof of the existence of technetium."

Visible Samples Displayed

Visible samples of two chemical elements which have been produced in the atomic-pile after defying previous efforts to isolate them in pure form were exhibited in public for the first time at the closing session of the ACS symposium. The elements displayed were numbers 61 and 43. Element 61 was shown in two states, the nitrate and the chloride, appearing as pink and yellow smears, respectively, on white porcelain discs. Between two and three milligrams of each type were exhibited. Element 43 was also displayed in two forms, a silvery metal and a white oxide, looking like ordinary table salt. Slightly less than milligram amount was used.

SCIENCE AND "PLANNING"

Dr. Lampitt Deplores Loss of Individual Enterprise

IN his last formal address as president of the Society of Chemical Industry, at the opening of the 67th annual meeting in Edinburgh, last week, Dr. L. H. Lampitt presented a spirited criticism of the limitation of the functions of scientists by the continued expansion of State-aided research. He deplored especially the illusion that the ultimate objects of science could be fully served within a planned economy and lamented the passing of disinterested research.

Pseudo-Civil Servants

The effect of some recent national changes, said the retiring president, was that a large number of scientists had become, willy-nilly, pseudo Civil Servants with all the restrictions on free speech and individual action which that entailed.

Rather than speeding the application of the results of scientific advance to economic advance, the reverse would be likely to result. The scientific departments could become too big, and the work of the scientist be bogged down by bureaucratic control, unless a compromise emerged

The private consultant was almost gone, the laboratories of small firms were becoming loosely bound together in research organisations, firms controlling their own scientific development were restricted to a few of the larger, and State-aided research had assumed almost menacing proportions.

Brute Force and Expediency

"I deplore the passing of the amateur—and they are passing," he added. "They were generally solitary workers, and to-day it is recognised that strength counts and there is no place for them. Brute force is worshipped, while intelligence and culture are at a discount. The dock labourer earns more wages than the average minister of the Church of England."

Dr. Lampitt said that no scientist worthy of the name could subscribe to Mr. Herbert Morrison's idea that all research work must be judged by its utilitarian value. The whole idea underlying such comments would strike at the roots of all fundamental work in the scientific field. It was also entirely wrong to draw, as Sir Stafford Cripps had recently done, an analogy between our scientific war-time effort, and research in pure or applied science in times of peace.

It was necessary to distinguish between research and investigation. The former, he said, was more fundamental and refused to be planned, while the incentive for research and its reward was the satisfaction that came from the expression of the desire to explore the unknown. Investigation was concerned with the application to practical problems of the result of research, and the incentive was a tangible reward.

"Stalin or Hitler"

"It is to be deplored," said Dr. Lampitt, "that, following the popular lead, there are so many Leftish intellectuals in the ranks of scientists in the country to-day, who would plan everything for us. They forget, or appear to forget, that they cannot plan brains or inspiration.

"These followers of Stalin, or is it of Hitler—I see so little between them—would plan the whole complex structure of scientific life and effort. The tragedy—or the

(*Continued overleaf*)

Dr. Carroll H. Hochwalt (right), director of Monsanto's central research laboratories at Dayton, O., presents to the society the gavel and casket, the gift of the U.S. section, made by Dr. Wallace P. Cohoe, a past president, of timber from London's Guildhall

The New President

Greeting to S.C.I. from Australia

Sir David Rivett

THE acceptance by Sir David Rivett, K.C.M.G., F.R.S., of the presidency of the Society of Chemical Industry, 1948-49, in succession to Dr. Leslie H. Lampitt, who has held office for two years, was communicated to members in a personal message. The new president, who was unable to leave Australia, where he fills many of the principal offices in scientific and chemical organisation, wrote: "Need I say how deeply I appreciate the honour of the presidency of this great society?

"Industrial chemistry in Australia is, compared with its British parent, still an infant; but it is a sturdy infant and it is a great pleasure to me to convey to you very warm greetings from your many colleagues who are 12,000 miles away from you in your meetings in Edinburgh.

"Our British Commonwealth has passed through troubled waters of late, but in the developments that lie ahead in our widely scattered members, there is an immense part to be played by chemists. If I can manage to be with you at the 1949 meeting (I shall do my very best to do so), it is in my mind to talk for a little on 'Chemists and the Commonwealth' and maybe to provide some indications of the way in which chemistry and industry may contribute to the broad tasks that lie before us.

"Absentee President"

"In the meantime, I shall be a very bad president indeed; absenteeism is undesirable in more fields than one; I am, however, not at all distressed on that account, being certain that the chairman of council will effectively deputise for me. I send him my cordial thanks in advance.

"Again, let me thank you all for your gesture to Australia and assure you that we deeply appreciate it and will do all we can in this outpost to work with you towards the many and varied objectives of chemical industry in the British Commonwealth."

The wide ranging activities of Sir A. C. D. Rivett and the extent of his services to chemistry in Australia and elsewhere are acknowledged in the summary circulated by the society of the new president's career. Born in Tasmania 63 years ago, he is most widely known for his work upon the phase rule.

He was deputy chairman and chief executive officer of the Commonwealth Council of Scientific and Industrial Research from 1927-45 and in the latter year was made chairman. He was created K.C.M.G. in 1935, and elected a Fellow of the Royal Society in 1941. He was the general organising secretary for the visit to Australia of the British Association in 1914.

He has been president of the Australian and New Zealand Association for the Advancement of Science; general president of the Australian Chemical Institute, and during the first world war he served in the Department of Munitions. His numerous publications, as might be expected, have concentrated principally upon the phase rule.

SCIENCE & PLANNING (*Continued from page 112*)

comedy—of the whole situation, is that with very few exceptions, they are dilettantes, full of high-sounding phrases. They plan for planning's sake, and not for the good of the community. They have a high mental volatility and a low intellectual flash point."

The result of the new order, said Dr. Lampitt, was a feeling of frustration, which to many in this country was but an added burden to the fear of the unknown, of new weapons of war and new political forces, being experienced in the U.S.A., Canada, France, Switzerland, Holland, Belgium, and Norway.

Only in so far as it was possible to stimulate a more spiritual outlook could they look forward with any degree of assurance for the future of the nations.

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THE STATE AND THE SCIENTIST

Sir John Anderson Surveys Growing Organisation

THE view that the structure which has been built up in Great Britain for the organisation of scientific research on a national scale was competent to serve the greatly increased demand was reflected in the survey, "Science in Relation to the Public Services," given by Sir John Anderson, M.P., to the Society of Chemical Industry last week.

This was the Messel Medal address and at the outset the speaker was presented by the president (Dr. L. H. Lampitt) with the Messel Medal, given every two years in recognition of individual distinction in science, literature, industry or public affairs or in service to the society.

Sir John qualified the approval he gave to the general scientific organisation associated in greater or less degree with the State by saying we were still far behind the U.S.A. in the development of research and we still lacked an adequate force of scientists and technologists.

He prefaced his review of existing organisations by recalling how recent was the development of them in their present form. Most of the progress had been made since the beginning of the century and the formation of much of it was associated with the discovery during World War I how inadequately we were equipped scientifically, and especially in chemical affairs. At the beginning of the century, bacteriology, biochemistry, radiology and chemotherapy were uncharted regions and there was no industry of any size established on a basis of science. For scientists, there was little scope outside the academic life.

"It was really rather deplorable," continued Sir John. "There was practically no commercial production of pure organic substances. Even crystal carbolic could only be obtained in absurdly small quantities. There were no dyes except azo-dyes, alizarene (turkey red) and a few others. There were no home-produced synthetic drugs, even such vitally important ones as salvarsan, aspirin, or any other anti-pyretic, no local anæsthetics, no atropine.

"That was our desperate situation when German supplies were suddenly cut off. True, we were well provided with general anæsthetics, natural alkaloids and the heavy chemical industry was in a flourishing state, but we had no fine chemicals and for the maintenance of the life of the community, not to speak of the running of the war. They were absolutely essential."

With the increasing importance of technology, both for industrial and military

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The presentation by the retiring president (right) of the Messel Medal to Sir John Anderson

ADVANCE OF INDUSTRIAL CHEMISTRY

Medicine's Debt Acknowledged at SCI Dinner

THE high regard in which the Society of Chemical Industry is held by leaders of science in many departments was shown by the distinguished body of guests at the

Sir Charles Harrington

table of the chairman, Dr. Leslie H. Lampitt, at the 67th annual dinner in the Assembly Rooms, George Street, Edinburgh.

The dinner marked, as the chairman observed, his swansong after two years as the society's president, and he spoke with feeling of his appreciation of the co-operation he had received and the honour which the society had conferred on him in the past.

At the close of the proceedings Dr. F. H. Carr, chairman of the British Drug Houses, pinned on Dr. Lampitt's lapel a gold replica of the badge of office commemorating his presidency. Dr. Carr said he hoped it might serve to revive in Dr. Lampitt memories of his great service to the society and of the friendship he had created and fostered. He voiced the society's hope that Dr. Lampitt would continue to figure among their distinguished past presidents for a great many years to come.

Aid to Medicine

Generous recognition of the great contributions made in recent times by industrial chemical research to the furtherance of medical science was paid by Sir Charles Harrington.

Submitting the toast of "The Society of Chemical Industry," he revealed at the outset that he had "escaped by the narrowest margin" from his earliest intention, which was to enter chemical industry. To-day, although he had spent a long working life in the service of academic research, he had the warmest appreciation of the achievements for which chemical industry was responsible. In his association with one of the most important medical research departments in the country he had come to recognise that more and more the progress of medical research had come to depend on advances in chemistry. Such contributions as the preparation of penicillin evidenced that more and more were the research laboratories of industry taking on the functions of academic research and less and less was the apparent division which used to distinguish the two. He cited as a notable example the synthesis of anti-malarial drugs. That had occupied the

(*Continued overleaf*)

Dr. F. H. Carr presents Dr. Lampitt with a memento of office

Dr. W. M. Ames, chairman of the Edinburgh and E. of Scotland Section, SCI

attention of chemists for many years, and in the last few years they had been rewarded by the production of the best of the anti-malarial drugs—paludrine.

Another great achievement of the same kind was the preparation of a means of combating that most deadly disease, scrub typhus, and moreover, one which provided a cure even in most advanced cases. The importance of this lay in the fact that it had enabled our Armies to sustain their rôle in war in the Far East, and also that it had revived the hope that eventually we shall be able to deal with virus diseases by chemical means; nothing could be more important than that. Both these contributions had been made by industrial laboratories.

Now, in the same quarter had been achieved the isolation of the active principle of liver for the treatment of pernicious anæmia. This had been achieved both here and in the U.S.A.

In the light of these advances, who could presume to assert that such work could flourish only in the ivory tower of a research institution?

In a comprehensive view, he could see nothing but good in the way the various branches of science were developing, excepting perhaps in the increasing competition for scientific manpower. He could have given many more examples of the disappearance of the lines defining academic and industrial research, but he was perfectly certain there were present many others as capable of developing that theme from the fruits of their own experience.

He had noted also a great intensification of scientific endeavour and was certain that in spite of all the difficulties, perhaps because of them, there had been a great intensification of intellectual activity in this country. So long as that continued they need have no fear for the future.

Meanwhile, the wide variety of the subjects with which the SCI was concerned and the lengths to which they went in them was greatly strengthening the links between academic and industrial chemistry. All branches of science would join in wishing the society increasing success in its activities, which were capable of being of such great value to industry and to the country.

Recognition

The chairman, in his response, said members of the society would greatly appreciate the honour done them by the toast and by the distinguished people who had gathered together for that occasion. He congratulated Sir Charles Harrington on the fact that the King had recently seen fit to honour him by the award of a knighthood, and in doing so had honoured chemistry too.

It gave them great pleasure to see this recognition of men who had worked for the same objects and especially of those who had worked for the good of the country without any ulterior object.

Members of the SCI liked to flatter themselves that they were translating the work of academic chemistry into terms of the needs of the country at large—and the needs of humanity. They were proud of the many people within the society who were devoting their time and energy to that interpretation.

Like most scientific societies, the SCI was suffering from a feeling of frustration. Their job consisted, among other things, in the publication of scientific matter. It was, for example, of no use Sir Charles performing a wonderful synthesis unless the scientific publications made the facts manifest to the world.

But the society could not get paper, and, while pseudo-pornographic literature was abundant on the bookstalls, they went on bended knees to the controllers for five cwt. of paper.

He was happy to testify that the spirit which was behind the society was good and he assured his hearers that they could look forward to a growth equivalent to anything that had taken place in the last 20 years. That was a great thing to say of any society.

(Continued overleaf)

THE STATE AND THE SCIENTIST

(Continued from page 114)

ends, and with a growing participation of Government in industry, agriculture, and the social services, there were now few departments of State completely unconcerned with technical innovation or with the possibilities offered by the scientific method in the form now known as operational research.

A large proportion of the scientific data required for application by the Government and industry, is produced in university and industrial laboratories, but the Government itself had assumed in recent years great responsibilities for basic scientific research, and also for its development and application in public services, and industry. There were therefore many aspects of scientific policy which must be kept under constant review to ensure that facilities and data are adequate for national needs.

Great Britain has been, and still is, a pioneer among the nations in the organisation of scientific research. While there was much criticism of the existing arrangements for carrying on such research and applying its results to practical ends, it could be claimed with justice that a system of great intrinsic strength and flexibility has already been built up and that future progress should be looked for in the extension and adaptation of what we now possess, filling in gaps and making good shortcomings as they become apparent, rather than radical change.

Many Critics

The system of Research Councils had many critics who complained that they were not sufficiently in touch with reality, and that agricultural research, for example, should be carried out by the Ministry of Agriculture, medical research by the Ministry of Health. The virtues of the system were, however, very great, in that carefully planned, long-term research was made possible without interruptions due to local departmental policies or temporary expediency.

A particularly interesting feature of British research was the basis of co-operation established between Government and industry, which enabled industrial research associations to undertake research and development on behalf of particular industries, supported by public as well as privately contributed funds, and free from bureaucratic interference.

The Government grant system administered by the Research Councils singled out for support men of ability, rather than laboratories, which might have their periods of scientific fertility and sterility, according to the men they attracted.

The second stage in scientific development, the establishment of properly equipped research units in individual departments of Government, had been brought about by the second great war. Central co-ordination was provided by the establishment in 1940 of the Scientific Advisory Committee under the direct control of the Lord President of the Council, and of the three scientific advisers later attached to the Ministry of Production. That had now blossomed into the Advisory Committee on Scientific Policy, which might be regarded as completing the third stage.

Scientific Background

Of prospects for the future, Sir John called attention to the most recent evidence, afforded by the establishment of a National Research and Development Corporation, and to the Committee on Industrial Productivity announced in the House of Commons last December. He referred more than once to the important offices filled by Sir Henry Tizzard in several of the newer Government organisations concerned with scientific development.

Speaking of the status of scientific staffs in the Government organisations and their relationship to the administrative staff, he said these matters had now been settled, he hoped satisfactorily, without resort to the device of a scientific general staff, which he had never favoured.

The provision of adequate scientific staffs, however, was not everything. There must also be an understanding of scientific matters on the part of the administrative staff, and in that connection he had urged elsewhere that measures should be taken to ensure that a larger proportion of the recruits to the higher administrative branches of the Civil Service should be men with some scientific training.

ADVANCE OF INDUSTRIAL CHEMISTRY

(continued from previous page)

Further cordial recognition of the great aid chemical industry had given in providing means of combating disease conditions was paid by Prof. Sydney A. Smith, responding to the toast of "The Guests," proposed by Mr. Stanley Robson, Foreign Secretary of the SCI. Without such weapons as DDT, there might, he said, have been epidemics of catastrophic proportions. . . . "If you go much further you may put us boys out of a job altogether." Other toasts were "The City of Edinburgh," proposed by Mr. C. S. Garland and responded to by Col. Drummond, Master of the Merchants' Company of Edinburgh, and "The President," proposed by Dr. W. M. Ames, chairman of the Edinburgh and East of Scotland Section, and responded to by the chairman.

Chemical Industry's Role in Scotland

Dr. Lampitt's Warning Against Reliance on Paper Work

THE chemical industry had a very important function to perform in the industrial progress of Scotland, said Sir Steven Bilsland, Bt., chairman of the Scottish Council (Development and Industry), in Edinburgh last week when he spoke at a luncheon given by the Council to the Society of Chemical Industry.

He said that two of the Scottish Council's main objects were to assist in bringing about a better balance in Scotland's industrial structure, and to do so by encouraging the growth of industries which depended technically on the prosecution of industrial research on an adequate scale. There was no industry whose growth they were more anxious to promote than the chemical industry, which satisfied these conditions better than any other.

The council was taking a close interest in the conditions which would have to be met if the hydro-electric power generated in the Highlands led to associated developments in the chemical industries. There had been discussions with several firms on that issue.

Mineral Resources

Assessment of the possibilities of exploiting Scottish mineral resources had not been undertaken in the past, except in particular cases. A panel had just been appointed to carry out this task, however, and a survey would be made of the possibilities of finding economic chemical uses for certain agricultural raw materials and for part of the output from the afforestation schemes.

Sir Steven praised the work of the Society of Chemical Industry in the promotion of international friendship. The society had 1000 members in the U.S.A., 500 in Canada, 300 in Australia, and 700 drawn from various parts of the continent of Europe.

"We are anxious to enlist your interest in the work which we are endeavouring to do in this part of the U.K. to ensure the industrial progress of Scotland," emphasised Sir Steven.

Replying, Dr. L. H. Lampitt, president of the society, spoke of what he termed "a despairing cry" made earlier in the week by Mr. W. M. Ames (chairman of the Edinburgh and East of Scotland section) who said he was "fed up because Scotland was not getting the recognition she should have." Dr. Lampitt could not believe that was so.

"Catalysers"

Addressing Sir Steven, he said that he took it that the council were trying to act as "catalysers" and wanted to bring about a reaction of the national resources of the country—a reaction that would change them into some kind of economic security. He gave a warning that catalysts sometimes were poisoned. One way in which they might be poisoned was by not being able to digest the stuff they turned out.

Dr. Lampitt said that he had a lot of connections with Unesco, which appeared to live on the amount of paper it produced and the number of reports it issued. He regarded the position of a body which only issued reports, and could not see that they were implemented as a very difficult one. "I feel you are not going to suffer from that kind of indigestion, but you will catalyse not by paper reports but by personal contacts with the people who can bring things into being," asserted Dr. Lampitt.

Dane's Advice on Peat

Means of securing a much greater yield and wider uses of Scottish peat were described in Edinburgh last week by Mr. Paul Egenfeldt, a Danish peat expert. He described to a meeting organised by the Scottish Council (Development and Industry) the modern machinery by which Denmark during the war harvested 4.5 to 6 million tons each year, to replace coal. The delivered price was equivalent to 58s. per ton, compared with 127s. for coal. The machinery made by his company macerated the hand-cut turf from the primary and secondary layers, of which peat-bogs consist, the maceration greatly accelerating the drying process. The sub-soil exposed would be suitable for agriculture.

Oil Conversion Scheme Deferred

Rumours that the £45,000 oil storage tanks recently completed at Belle Vue (Wakefield) railway sheds are to be completely dismantled, owing to Government abandonment of a programme for converting 1229 locomotives from steam to oil, have been denied. It is anticipated that only those parts of the tank which might be affected by weather will be removed. The four tanks, each capable of holding 4000 barrels of crude oil, will refuel oil-burning locomotives when oil supplies improve. At the loco shed offices on July 13, an official said that the Wakefield scheme had been halted, at any rate for the time being, "because of shortage of oil or other materials."

PLAN FOR SCOTTISH PLASTICS

To Dispense with English Synthetic Resins ?

THE establishment in Scotland of a plastics industry fully supplied by locally-produced raw materials from several sources is one of the most significant of the recommendations advanced by the Scottish Council (Development and Industry). The present plan, of which details were published last week-end, is one on which the Plastics Committee of the council has been working for a considerable time.

Professor W. M. Cumming, professor of chemistry at the Royal Technical College, Glasgow, who is a member of the Plastics Committee, stated at a Press conference in Edinburgh that Scotland was at present dependent on England for the majority of raw materials and the committee felt that the industry could not be fully developed until it became independent of " imported " raw material.

The committee had satisfied themselves that Scottish engineering firms were capable of turning out the high precision moulds and presses that were needed by the industry, and they had considered how Scotland could produce the raw materials.

The committee has recommended four main lines of development in order to provide raw materials for established manufacturers and to stimulate the kind of activity which had already made the plastics industry the third in value in the U.S.A.: (1) The establishment of a carbide acetylene industry to produce 30,000 tons of carbide per annum, using 5 per cent of the estimated electrical energy from water power in Scotland. (2) The manufacture of synthetic phenol in one or other of the explosives factories established in Scotland during the war. (3) The processing of unsaturated gases which could be made available from the petroleum and shale oil refining industries and from coal carbonisation; and (4) The recovery of ethylene from coke oven gas, starting with one plant; and an annual output of 4500 tons.

23 Firms Engaged

The report gives a list of 23 firms which are already engaged in plastics manufacture in Scotland. Their products range from combs and bottle caps to wireless cabinets and laminated plaster boards. The most commonly used plastics material is the phenol-formaldehyde type, with a filler of wood meal or asbestos. Recently there has been a limited extension into other types of plastics—polystyrene, polyvinychloride, certain cellulose derivatives, and urea formaldehyde. These are mainly imported from the South or elsewhere.

There is in Scotland a limited manufacture of synthetic resins for special purposes, but practically no manufacture of the essential components of the moulding powder or of the plasticisers to facilitate the moulding process.

The manufacture of carbide, the report states, cannot be long delayed in this country if the plastics industry is to become independent of imported raw material. Our imports of calcium carbide from Norway in 1938 amounted to 32,000 tons, produced almost entirely from materials supplied from Britain and processed by hydro-electric power in Norway.

Chemicals and Power Costs

The committee emphasised that it is much more concerned to see established an acetylene industry than a carbide industry alone. The value of the chemical products, it is suggested, would more than compensate for any difference in the cost of production of power as between Scotland and Scandinavia.

The committee does not expect any marked increase of production of phenol and cresols, although a new plant under erection by the chemical works department of Glasgow Corporation will increase the home output. It proposes that the demand for phenol should be met by synthetic production from pure benzene, a process which would appear to provide a suitable way of utilising Government explosive factories in South-West Scotland. An approach should be made to the Ministry of Supply and the Director of Ordnance Factories.

The committee also felt that sufficient olefinic material could be produced in Scotland from either petroleum or shale oil to meet the needs of a plastics industry. The output of shale oil is approximately 125,000 tons per year. As no cracking of oil for the production of motor spirit is practised at the moment, it might be feasible to crack gas oil or spirit with the main object of producing ethylene, propylene and butylene being obtained at the same time.

The possibility of extracting ethylene from coke oven gas is limited to plants with a substantial through-put of coal per day. At the moment, the report states, there is only one plant of this type with a sufficiently large production of gas to warrant the introduction of any of the better-known methods of ethylene extraction. The possibility of increased ethylene production is bound up with a reorganisation of the industry and a grouping of plants in such a manner that each plant would have a capacity of not less than 1000 tons of coal per day.

Mechanical Handling Devices

Apparatus of Interest to Chemical Industry

THE latest types of trucks, hoists, conveyors and a host of ingenious appliances for the speedy handling and transmission of materials of all kinds, either in bulk loads or small quantities, provided fresh evidence of British engineering skill to foreign buyers who visited the first National Mechanical Handling Exhibition which has just closed at Olympia after a successful 10-day session.

About 130 firms were represented at the exhibition, which was organised by the journal *Mechanical Handling*, and officially opened on July 12 by Sir Stafford Cripps. The stands occupied a total area of 55,000 sq. ft. on the ground floor and gallery of the National Hall and during the display special film and lecture periods were devoted to problems arising from the handling of various types of merchandise.

Though much of the equipment on show was designed primarily for the lifting and stacking of crates, cases or "awkward loads," several items were of interest to chemical manufacturers, including bag-fillers, vibrators and over-head conveyors.

Vibration Transmission

Among a number of firms displaying the latest types of electric vibrating feeders and conveyors, many of them suitable for the sugar industry, were Lockers (Engineers), Ltd., Warrington, whose flameproof vibrator which has now been approved for use in explosive atmospheres in mines, attracted considerable attention, and Fraser & Chalmers, Erith, who exhibited electro-magnetically operated vibrating equipment, together with numerous illustrations of heavy material-handling equipment.

Instruments for the accurate measurement of liquids—"Tecalemeters"—together with a wide range of automatic lubrication apparatus for oils and greases formed the centre-piece of the stand occupied by Tecalemit, Ltd., Brentford.

Handling of Nitrates

A bag-filling machine, weighing only 9 cwt. and easily handled by two men, was exhibited by Crone & Taylor, Ltd., St. Helens. The machine fills bags with nitrates and similar materials at the rate of 10 tons per hour and on a short capacity test recently filled 7 tons of nitrate into bags in half-an-hour. The power taken is only 1 b.h.p. and running costs average about ¾d. per hour.

Portable sack loaders of the chain and lathe type were also on the firm's stand.

A wide range of flexible hose assemblies were the principal exhibits displayed by the Dunlop Rubber Co., Ltd. (Aviation Division), Coventry. These flexible pipes cater for high, medium and low operating pressures and are very effective for the conveyance of liquids and gases under pressure or suction in plants where the installation of rigid pipes would be difficult.

Another firm showing the latest development in flexible pipe assemblies for use in the handling of hydraulic fluids, oils, petrol, paints and chemicals, was Weatherhead Equipment (Division of Aviation Corporates, Ltd.).

Dust and Fume Removal

Pneumatic despatch tubes, conveyors, chutes and hoists, many of them specially adapted for the speedy removal of dust and fumes were featured on the stand occupied by Lamson Engineering Co., Ltd., with portable, adjustable and reversible mobile conveyors.

Additional equipment of interest to the chemical industry was exhibited by Alite Patent Machine Co., Ltd., showing a wide range of filling, sifting and mixing machinery for use in the manufacture of cosmetics, soap-powders, fertilisers and insecticides.

Many exhibitors displayed a wide variety of trucks, drum-handling gadgets and lifts, most of which were particularly suitable for use in the food, chemical and paint industries.

Penicillin In Ampoules

Simultaneously with the latest reduction in price of penicillin a useful development in penicillin packaging was announced last week by Glaxo Laboratories, Ltd., of Greenford, Middlesex, which introduced a single-dose penicillin ampoule. The new sealed glass ampoules will contain 100,000 units of either freeze-dried yellow penicillin or crystalline penicillin for injection.

The decision to introduce an ampoule was taken as a result of the increasing tendency of the medical profession to adopt the unit dose of 100,000 units of penicillin as standard for injection and as a minimum dose.

The new containers ensure for penicillin complete freedom from humidity during storage and transit—of especial importance particularly in export—and it is also more economical to produce. The new pack was exhibited at the B.M.A. Exhibition at Cambridge.

SPANISH CHEMICAL PROGRESS—I

Growing Use of Indigenous Materials

THE first Spanish-Portuguese Pharmacy Congress was held in Madrid, May 30-June 6, under the patronage of General Franco and leading Spanish and Portuguese officials and scientists. The gathering was notable for a remarkably comprehensive and informative paper contributed by Dr. Victor Villanueva Vadillo, of the Real Academia de Farmacia, from which the following notes are taken (*ION*, May, 1948, pp. 285-292).

One important item in the preliminary proceedings was a resolution to promote closer professional union between the pharmacists of Spain, Portugal, and America. The reference to America possibly means the countries of Central and South America rather than the U.S.A.

10 Years' Progress

Dr. Vadillo prefaced his paper with some observations on the many political and economic difficulties which, in Spain as in other countries, had hindered technical and commercial progress; but he said that much progress had been made in his country during the past 10 years, and more than 6000 drugs, medicinals, etc.—many of them in short supply or hitherto imported—were now being made.

Home requirements of ephedrine had been met, and this year production was expected to exceed 1000 kg. In addition, ergot alkaloids, such as ergotine, were now being made in increasing quantity from the raw material "cornezuelo." (This would appear to be the Spanish equivalent for the ergot fungus or similar substance. It contains one of the root terms in ergocornine and ergocorninine.)

The rich and varied flora of Spain, said Dr. Vadillo, provided abundant raw material for drugs, medicinals, essential oils, etc., not overlooking maritime vegetation, such as the *alga*, which are now being used for production of alginic acid and alginates, agar-agar, iodine, bromine and bromine salts.

Other products were the hydroquinone glucoside—arbutin—from the gayuba leaf and other plants (barberry, etc.); labdanum essence, digitalin; nicotinic acid amide for vitamin PP from nicotine provided by the Centro de Fermentacion de Tobaco de Malaga; crystalline glucosides from *Scila maritima* (one of the hyacinths); and atropine from *Atropa Belladonna* (nightshade).

Four factories were now using rice plant residues for production of the calcium and magnesium salts of inositohexaphosphate for home and export, 6 per cent yields being obtained, although the speaker did not reveal the basis of this percentage.

More Raw Materials

Spanish plantations of poppy were also being considerably enlarged and opium and other alkaloids manufactured on an increasing scale, including morphine, cocain, codeine, and derivatives. Special reference was made to the theobromine class, *e.g.*, from *cacao cascarilla*. These have hitherto suffered the disadvantages that raw material has been short and the cost of necessary solvents has been high, but the position has recently improved. The three factories producing thiobromine and caffeine had sufficient capacity to cover home needs, with a small surplus for export.

The fermentation industries were equally progressive, including the manufacture of glycerine by fermentation methods, for which exclusive patent rights have been granted to a Spanish group. New plant also had been installed for pure anhydrous glucose, to which it is hoped to add, during this year, calcium gluconate. It is hoped, too, to have more plentiful supplies of maize starch, in view of the present high price of imported manioc.

Owing to a recent extension of plant for biological synthesis operating in Valencia, there would be larger available supplies of amyl and butyl alcohols and both medicinal and commercial lactic acid is now being produced. Additional developments, said Dr. Vadillo, will include formic, oxalic, and citric acids, acetone, etc. The production of synthetic glycerine was also expected to reduce the heavy imports Spain had required in former years.

Reclamation Schemes

Recently increased attention had been given to Spanish resources in natural resins, with a view to extending production of terpineol, pinene (with camphene and isobornyl acetate), camphor and essential oils of isoborneol, cymene, carvacrol, thymol, and menthol, in close collaboration with producers of dyes, colorants, and fine chemicals generally.

Imports of castor bean had lately been heavy and serious efforts were being made by the Government and industry to increase home or colonial supplies. For example, land had been reclaimed in the Canaries and 1000 hectares had been planted with castor bean, to yield about 1500 kilos per hectare. Certain coastal lands in Spain

were also considered suitable for further extensions in this direction.

It is intended to augment supplies of vitamin E (alpha-tocopherol) from the wheat germ, of which more regular consignments are desirable to the special factories or laboratories concerned.

Reviewing therapeutic products from animal sources, Dr. Vadillo said that home producers could now supply at least 80 per cent of the national demand, although there had been some difficulty in supply of the requisite glands and animal organs owing to lack of up-to-date abattoirs in many parts of the peninsula and of suitable means to ensure transport of raw materials in good condition.

Marine Products

Nevertheless, considerable progress has been made, *e.g.*, in hepatic extract, bile acids and derivatives, enzymes and hormones, including testosterone, dihydro-stilbestrol and its esters, and, on an enlarging scale, desoxy corticosterone. Marine animals found around the Iberian coasts provided an abundant source of raw material, *e.g.*, for vitamin A concentrates, the tunny fish liver being particularly valuable.

Vitamin content of these preparations ranges from 300,000 to 800,000 I.U. per gramme and this year it is estimated that there will be more than 800 mill. I.U. for export.

Output of Arsenicals

Owing to the demands of the cheese industry for milk whey, supplies of this for lactic acid manufacture had not been overplentiful, but steady production had been maintained, as in the case of albumin, lecithin, colesterol, and lanolin.

In the field of organic synthesis mention must be made, said Dr. Vadillo, of progress in arsenicals, formerly largely imported, insecticides of the DDT and other types, sodium diphenyl-hydantoate, acetanilide, mandelic acid, benzoic orthamide and sulphamide, thiouracyl, di-coumarin, endo-iodine synon, β-phenylisopropylamine, hexamethylene-tetramine or urotropine.

Increased output could be reported of penylquinoline-carboxylic acid and its methylated derivative, organic and inorganic gold salts, iodated esters of vegetable oils by radiological assay, the sodium salt of o-iodohippuric acid, sodium tetra-iodophenolphthalein, and the ethyl ester of "colancoba" oil from seeds obtained from Spanish Guinea. Further developments and augmented outputs included adrenalin, diacetyl-dioxyphenyl-isatin, and vitamin K (-methyl-naphthaquinone-1 : 4).

(To be continued)

Long-Term Plans for Indian Metals

INDIA'S intention gradually to supply her own needs in science and technology in industry was reflected in the recent inauguration of a department of metallurgy at the Indian Institute of Science, Bangalore. At the opening ceremony, Sir M. Visvesvarayya recalled that the knowledge of metallurgy, the science and technology of metal, is of great importance both for the automobile and aircraft industries, and these two highly-developed industries overseas would not have been evolved to their present state of efficiency, speed or usefulness, but for the simultaneous development of metallurgy.

The object of the founder of the Institute, the late Mr. Jamsetjee Nusserwanjee, was to spread technological skill and knowledge of machinery among the people in order to promote industries and industrial life in the country. He was told, he continued, in Sheffield that as many as 150 varieties of alloy steels were manufactured by electric furnaces, and 40 were in common use in India. Sir Visvesvarayya said that some six national laboratories had come, or were about to come, into existence, including a National Metallurgical Laboratory at Jamshedpur with an American expert in charge.

* * *

The first step in the creation of the Government of India's large-scale steel production works was taken up last week when the Government appointed the Koppers Company, of Pittsburg, as one of the consultants for the project. The Koppers company and two other consultants of international standing, Arthur McKee & Co. of Ohio, and the International Construction Company of London, with whom similar agreements will be signed shortly, are to make rapid surveys of resources and possibilities. It has yet to be decided whether to establish one plant of 1 million tons annual capacity or two plants, each capable of half that output. The preliminary reports of the consultants are expected within six months of their appointment. Preliminary forecasts assume that the work will be completed within five years. For adequate industrial development India needs 2½ million tons of steel per year, her present production capacity is 1½ million tons.

REORGANISING GERMAN CHEMISTRY

Effects of the Currency Reform

From a Special Correspondent

CURRENCY reform in the western zones of Germany has helped the chemical industry by cutting down absenteeism and thus increasing production. It has, however, temporarily stopped the normal flow of business, as consumers of chemical products prefer to await further developments before placing larger orders.

In the eastern zone the monetary reform has not had any similar repercussions, but the "two year plan" published by the Economic Commission for the Soviet zone shows that in eastern Germany, too, emphasis is upon increased production.

The manufacture of sulphuric acid and of nitrogenous and phosphatic fertilisers is to be raised considerably. The demand for soda has for a long time been larger than supply, and as production facilities in central Germany are not sufficient to meet all essential needs, especially in the soap and glass industries, it is proposed to erect a new soda factory at Stassfurt.

Industrial Supervision

Ten industrial associations have been formed in the Soviet zone to supervise the production of inorganic and organic chemicals, potash, technical gases and carbide, plastics, paints, soap and washing agents, pharmaceutical, and coal-oil products. They control 152 separate undertakings with over 30,000 workers.

The Soviet Military Administration has also issued an order setting up a Patent Office for the eastern zone, and special incentives in the form of bonus issues of desirable consumer goods are offered to inventors, engineers and chemists.

In the important industrial area of North Rhine-Westphalia, which comprises the whole of the Ruhr basin as well as the factories on the Lower Rhine, the past few months have witnessed a steady improvement in the production of basic chemicals, largely due to increased coal supplies. It is now hoped to meet all requirements of pyrites by importation and more lime is to be obtained from Hanover, Bavaria and Belgium.

The production of soda, generally regarded as insufficient to meet essential needs for glass and soap manufacture, is also to be increased this year, although the soap manufacturers themselves are clamouring for increased imports of fatty acids, rather than soaps and manufactured detergents, from which it would appear that they believe that there is enough soda. The glass makers have saved soda by using sulphate, but they as well as the china and pottery makers, who find it increasingly difficult to secure kaolin from Czechoslovakia, complain about continuing raw material shortages.

Supply Difficulties

The supply of nitrogen for industrial purposes is described as adequate, but production of the huge quantities needed by agriculture is hindered by lack of plant. Output of carbide would be higher if electric power could be spared for this purpose and a third furnace has in fact been put into commission at the Knapsack works, with the prospect of a fourth later this year.

A recent important event in the French occupation zone was the formation of Chlorbetriebe A.G. at Saeckingen, a mixed French-German enterprise in which French interests are holding 70 per cent of the capital. This new company has taken over the Rheinfelden plant of the former I. G. Farbenindustrie combine on lease. On the French side, several leading chemical companies are said to be interested, while on the German side the Rhodiaseta rayon factory at Freiburg is involved.

Another former I. G. Farbenindustrie factory in south-western Germany, the fertiliser plant at Hoechst, is now engaged in an extension scheme which is to be completed by May next year. The factory is now used for the production of nitrates of lime and sodium and its present annual output of 40,000 tons of pure nitrogen is to be raised to 60,000 tons. The manufacture of drugs, dyes, insecticides, plastics and solvents has also been resumed at Hoechst.

Other factories on the Upper Rhine and in Hesse report increased output, but since the currency reform, there seems to be some doubt about industrial profits. The occupation authorities regard this factor as one more reason for adherence to their policy of encouraging normal peacetime operations but discouraging self-sufficiency and substitution tendencies evolved before and during the war.

Recent Developments

Synthetic fuel production at Huels and Leverkusen was discontinued at the end of June on the instructions of the Military Government, partly no doubt because of the provisions of the Potsdam Agreement, but certainly also because coal consumption

(*Continued overleaf*)

South African Chemistry and Industry

A CEMENT factory, which, it is hoped, will produce 12,000 pockets of cement a day by the end of 1949, is to be built in Cape Province at a cost of £1.3 million. The operating company, which has not yet been floated, will be known as the Olifants River Portland Cement Co., Ltd., and is being sponsored by a syndicate headed by Mr. J. R. Janisch, a Cape Town business man. Representatives of the syndicate have already held consultations with the Minister of Economic Development and the project now awaits the approval of the Minister of Mines. The plant for the factory is being imported from Sweden. The factory site, which lies alongside the Bitterfontein railway line about 200 miles from Cape Town, is adjacent to ample deposits of limestone, gypsum, marble and clay.

* * *

An important experiment in the extermination of brown locusts has been completed at Graaff-Reinet. Government aircraft, field laboratory, whose scientists and staff returned to Pretoria carrying complete records of the first successful aerial attack on brown locusts in South Africa. In the Orange Free State and Transvaal, wheat grain crops and grazing land have been saved from the ravages of the insects and millions of locusts are lying dead on the veld. When the locusts first appeared ground parties using poison bait attacked the hoppers with some success, but were unable to prevent the formation of swarms, and farmers expressed anxiety at the situation, as grazing pasture was limited after the prolonged drought. It was then that the locust division decided to launch an aerial attack using the new gamma BHC aerosol. The aircraft flew at heights varying from 50-250ft., according to wind velocity and topography; and within three weeks wiped out every swarm over the breeding area. The new preparation is effective up to a fortnight or three weeks after use. Ground parties have been digging up locust-eggs for dispatch to Britain for research purposes, as it is important to ascertain what effect the new poison has on egg ferility.

* * *

A new safety glass welding lens has been produced by Shatterprufe (Pty.) Ltd., Port Elizabeth. The product incorporates a filter to obstruct the passage of harmful rays like infra-red and ultra-violet and the lens also possess several other safety features not found in ordinary solid glass. An official of the firm said that a large order had been received from Britain, and shipments had already begun. During the war the company manufactured over 5 million gas mask safety lenses for the British Government.

* * *

The South African Torbanite Mining and Refining Co., Ltd., Johannesburg, recently produced a highly fluxed road bitumin "Satrodil," which it is claimed not only lays the dust but also prevents the formation of road corrugations and provides a waterproof surface. A road covered with this bitumen, say the manufacturers, needs no watering or gravel maintenance. Application is simple and provides an asphalt-like non-skid surface at a comparatively low cost.

* * *

A new company, Industrial Planning & Research Corporation (Pty), Ltd., Johannesburg, has been formed to stimulate chemical research and development in South Africa. The company carries a large research staff which will advise upon problems connected with industrial chemistry, including initial work on pilot plants. It is also possible that the company will, in certain cases, offer financial support to new chemical undertakings.

REORGANISING GERMAN CHEMISTRY

(*Continued from page 123*)

for this purpose is uneconomic in present circumstances.

The tyre industry in Hanover is reverting to natural rubber and the use of buna is to stop altogether. Since the beginning of this month the production of buna has been prohibited in the Anglo-U.S. zone. On the other hand, synthetic fatty acids may still be produced, as the fats and oils required cannot be obtained wholly by imports.

The production of crude petroleum has shown a slight increase recently, owing to the successful yields of new oilfields in the Emsland region on the Dutch frontier.

The utilisation of other indigenous raw material sources is also encouraged by the occupation authorities, and the currency reform has revealed "secret" stocks of raw materials which will make it easier to increase production in chemical factories which have hitherto suffered from shortages.

ADVANCED ATOMIC ENGINEERING

U.S.A. to Use 12-Million V. Accelerator

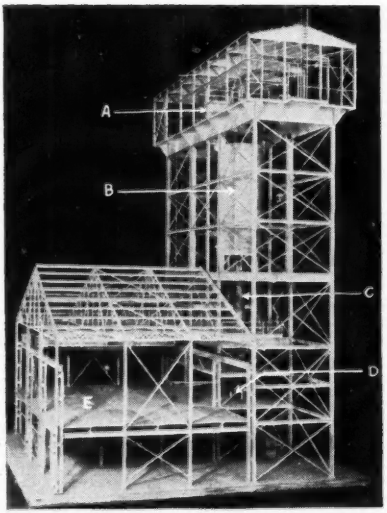
DETAILS of a new $2 million 12-million volt electrostatic accelerator to be constructed at the Los Alamos Scientific Laboratory, University of California, and designed to yield positive ions, have just been released by the U.S. Atomic Energy Commission.

Unique features of the new installation are concerned with the flexibility of its energy control and the extremely high precision with which this control can be maintained. The particle accelerators now under construction for energies in the multi-million or even billion electron volt range lack these features, nor are they particularly adaptable for the study of the properties of both light and complex nuclei below 20,000,000 electron volts. Much more precise data in this range is needed.

Easily Serviced

With the new accelerator the research worker will be able to change from one kind of ion to another, *e.g.*, from protons to deutrons, with comparative ease. In addition, the energies of these particles will be continuously variable from 2 million to 12 million volts. By a choice of accelerated particles and of target material, monoenergetic neutron beams of any energy between 30,000 and 30 million electron volts will be available.

The generator proper is enclosed in a steel pressure vessel 13.5 ft. in diameter and 39 ft. high which can be lifted by a 150-ton crane to expose the vital interior parts for servicing. This vessel will support internal pressures 18 times as great as atmospheric.



Engineer's model of the proposed 12-million v. accelerator. (A) Heavy crane; (B) pressure shell enclosing generator; (C) inner insulating column enclosing accelerator tubes; (D) 90° deflecting magnet; (E) target rooms

Operational Details

The heart of the accelerator is contained in a vertical column 25 ft. high, the upper five feet being devoted to the production of ions and the lower 20 ft. to their acceleration. This lower section is formed of a stack of 150 steel plates, 40 in. in diameter, and separated by insulators.

In a rectangular slot within this column, extending the whole length, runs a 30-in. wide cotton belt driven at 60 m.p.h. by a 100 h.p. motor. Electric charge is transferred to this belt at the base of the column and is carried to the top where it is removed from the belt. A very great potential difference may thus be built up between the upper electrode and the ground. This potential difference will then be used to accelerate charged particles in two evacuated tubes also contained in the column.

By means of an electrostatic lens in the upper part of each evacuated tube the ions are focused into a sharp beam just as electrons are focused in an oscilloscope tube. One of these ion beams is used to monitor the energy, while the other is bent to the horizontal by means of an electro-magnet and enters the target chamber and may be directed to any of several target assemblies.

A new feature of this electrostatic generator is a pressure-tight "separation" column which encloses the inner column, with its belt and accelerating tubes, and isolates it from the very high pressure region. This separation column may be locked to the outside pressure vessel so that the two may be lifted simultaneously. It will thus be unnecessary to release the compressed gas from the large volume of the pressure tank when it is required to service the vital parts of the generator contained in the inner column.

U.S. Needs Steel Scrap

Claim to Larger Share from Germany

MR. K. C. ROYAL, U.S. Secretary of the Army, was urged by Congress last week to take immediate action on a proposal by which not less than 1.2 million tons of scrap steel would be released from the Ruhr area of Germany. It was pointed out that America's post-war shortage of scrap could only be alleviated by purchase of a large proportion of the estimated 10 million tons of scrap metal in the Ruhr.

Authorities in Germany have allocated 1.2 million tons as the first instalment of German scrap supplies to the U.S.A., and other interested nations. Of this amount the U.S.A. was allocated 440,000 tons, Great Britain 600,000 and the remainder to 16 other claimants.

1948 Target Failure ?

Mr. Robert W. Wolcott, chairman of the U.S. Committee on Iron and Steel Scrap has gone to Germany at the request of the U.S. Secretary of Commerce, to see what can be done to eliminate the remaining obstacles which stand in the way of the shipment of scrap from Germany to the U.S.A.

In a recent letter to the U.S. Secretary of Commerce, Mr. Wolcott said that U.S. steel production may miss its 1948 objective by a wider margin than in 1947 unless iron and steel scrap was promptly shipped to America from overseas. Mr. Wolcott pointed out that the country's total stocks of scrap and pig iron are at present only 40 per cent of pre-war level. In his opinion, overseas countries to which 150 million tons of U.S. steel had been shipped in recent years, now possessed scrap metal stocks which exceeded their requirements and a certain amount should be returned to the U.S.A.

ANOTHER STEEL RECORD

PRODUCTION of steel in June reached the record annual rate of 15,444,000 tons, comparing with 15,220,000 tons in May, and 13,206,000 tons in June last year.

Pig-iron output in June at the annual rate of 9,417,000 tons was less than in May (9,552,000) and April (9,433,000), although it exceeded the annual rate for the first three months of the year which averaged 9,084,000 tons. The production rate for June, 1947, was 7,502,000 tons.

Chrome Chemicals Quota

No Further Cut in U.S. Exports

THE U.S. Department of Commerce has announced that no further cuts in the reduced export quotas for chromic acid and sodium bichromate are contemplated at present. It was determined at a meeting of U.S. Government officials and trade representatives that, while chrome chemicals domestically are scarce, U.S. exports of those products do not constitute a major contributing factor to the shortage.

It was also agreed that the current export rate "constitutes an irreducible minimum to help meet the essential needs of foreign countries, including those which supply the chrome ore used in manufacture of these chemicals." The trade and Government representatives further concluded that more equitable distribution among U.S. users of chrome chemicals could relieve current domestic shortages.

The quota set for U.S. exports of chrome chemicals for the second quarter of 1948 was 400,000 lb. This quota represents a progressive reduction from the 1 million lb. quarterly rate of a year ago.

RECORD U.S. HARVEST

THE greatest harvest in U.S history was predicted by the Agriculture Department in its July report on crop conditions issued on July 9. Maize production this year was forecast at an all-time record of 3,329 million bushels (83.25 million tons). The wheat prospect, with the harvest well under way, was placed at 1242 million bushels (a U.S. wheat bushel is 60 lb.), an increase of four per cent over earlier estimates, and second only to the record production of 1365 million bushels in 1947.

The food grain outlook is further improved by the prospect of a record production of 79 million bushels (60 lb. per bushel) of rice, and of more than 27 million bushels (56 lb. per bushel) of rye, the largest crop since 1943.

Flaxseed production—estimated to be 43.66 million 56-lb. bushels—probably will be the second highest in history. The record was 50 million bushels in 1943. Other oil seed crops will be much larger than usual.

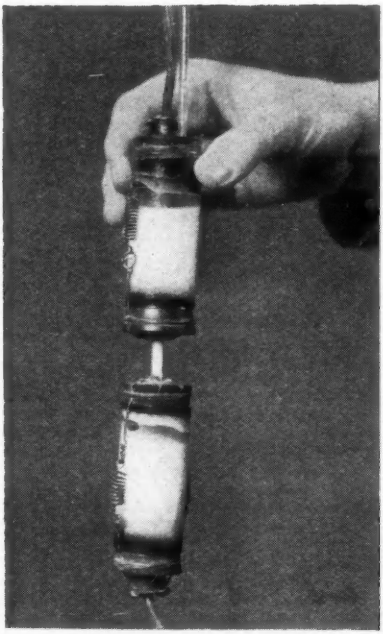
Several cereal products will be removed on July 9 from the U.S. Commerce Department's positive list of scarce commodities and thereafter the products may be shipped without validated export licences to any destination outside the European area.

MEASURING SPECIFIC RESISTANCE

U.S. Has Simplified Conductivity Cell

A NEW type of conductivity cell, made of inexpensive materials, and quickly and easily dismantled, has been developed at the U.S. National Bureau of Standards by Dr. Earl Otto. Its purpose is to determine with precision the specific resistance of viscous liquids, pastes, suspensions, and wetted powders.

Commercially available types of conductivity cells have hitherto been limited to use with non-viscous liquids, so that studies of the resistivity of the gelatinous pastes and carbon-manganese dioxide mixture used in dry cells have been confined in the past to investigations of the constituent electrolytes. The new cell was developed to determine separately the resistivities of dry-cell components at the low temperatures encountered in use in aircraft at high altitudes.



The two compartments of the cell house electrodes of oil-impregnated graphite to which the top and bottom lead wires are connected

With some alteration of cell dimensions, the cell is expected to be very useful in measuring the conductivity of glues, viscous aqueous solutions, aqueous cement suspensions, pigment slurries, clay suspensions, moistened soil, and similar materials and is expected to find applications in the textile, plastics, and soap industries and in the manufacture of adhesives, batteries and ceramics.

Components

The electrodes in the new apparatus are made of graphite impregnated with paraffin oil, instead of the more usual platinum. The corrosive action of the ammonium chloride electrolyte used in dry cells and the sturdiness and durability of the carbon electrodes makes this desirable. The reservoirs of electrolytic material surrounding each electrode are separated by a small-diameter tube that also contains some of the electrolytic material, in order to obtain a cell with a satisfactory constant for use with strong concentrations of highly conductive salt solutions.

The two graphite electrodes, like those ordinarily used in D-size dry cells but shortened to about 1 3/16 in., are inserted in glass tubes about 2¾ in. long and 1¼ in. inside diameter. These larger tubes are joined by a 3 in. tube having an inside diameter of ¼ in., the connections being made with rubber stoppers.

The extreme end of each electrode has an electrolytically deposited coat of copper, to which is soldered a lead wire. The leads are protected by glass or plastic tubing, the ends of which are embedded in the top and bottom rubber stoppers. The large glass tubes are graduated to permit insertion of stoppers to the same depth each time the cell is assembled, and the stoppers are connected by springs to prevent leakage of material.

The cell will withstand considerable rough handling and some parts may be replaced without a redetermination of the cell constant. An ordinary conductivity cell, on the other hand, requires expert glass blowing to repair a break, and the repair must be followed by replatinising of the electrodes and a recalibration of the cell.

While designed primarily for use with viscous materials, the cell also has some advantages for the study of free-flowing liquids. Since it may be wiped dry before loading, there is no need of rinsing with the liquid under test, as is done before a commercial conductivity cell is used.

American Chemical Notebook

From Our New York Correspondent

A NEW information circular, "Ammonium Nitrate: Its Properties and Fire and Explosion Hazards," was released this week by James Boyd, Director of the United States Bureau of Mines. The publication presents a brief summary of published scientific information on this widely-used white crystalline compound, together with an up-to-date bibliography for reference. Prepared by G. E. Scott and R. L. Grant, chemists attached to the Explosives Branch of the bureau at Pittsburgh, Pa., the publication deals with accidents and disasters, manufacture of ammonium nitrate, preparation as a fertiliser, physical properties of pure ammonium nitrate, decomposition and oxidising properties, spontaneous heating, and detonation.

* * *

Attention was focused on the destructive potentialities of ammonium nitrate by the explosion and fire disaster at Texas City, Texas, on April 16, 1947. Eighteen fires, serious explosions, and disasters involving the chemical compound have occurred in various parts of the world since 1896. At the present time, according to the circular, ammonium nitrate factories built during the war are manufacturing and shipping increasing amounts of this compound for use as a fertiliser. The circular, No. 7463, may be obtained free of charge from the Bureau of Mines, Publication Section, 4800 Forbes Street, Pittsburgh 13, Pa.

* * *

Commercial production of the rubber accelerator, Good-rite Erie, in a new, easy processing pelletised form was announced this week by the manufacturer, the B. F. Goodrich Chemical Company. Formerly supplied as a rubber-soluble liquid, Erie is now available in dustless, free-flowing black pellet form containing 50 per cent active agent absorbed on carbon black. Among the advantages claimed for Good-rite Erie are its chemical stability and the avoidance of any necessity to prepare a rubber master-batch of the accelerator prior to its use in a final compound.

* * *

Dr. Harry R. Copson, research chemist with the Bayonne Research Laboratory of the International Nickel Company, Inc., recently presented a technical paper, "Factors of Importance in the Atmospheric Corrosion Testing of Low Alloy Steels" before the annual meeting of the American Society for Testing Materials in Detroit. He discussed the complicated nature of this type of test, and pointed out that results depended to a large extent on location, duration, manner of exposure, the weather and the method of estimating corrosion. Data obtained during five years of exposure of 71 alloy steels at Rhode Island, accompanied the paper, together with reports on tests conducted at International Nickel Bayonne Research Laboratory, New Jersey.

* * *

W. R. Herod, president of International General Electric Company, who has recently completed a four-month tour of the Far East, said that present economic conditions in Japan did not warrant the resumption of his firm's activities in that country. Prior to the war, General Electric had a 24 per cent interest in the Tokyo Shibaura Electric Company, the largest company in Japan. He said now, that the decision not to resume operations was based on the fact that no peace treaty or reparation settlement had been formulated, and no one knew the level of industry permissible. In addition, no action had been taken to implement the law concerning decentralisation of industry beyond the appointment of a decentralisation board, and a high degree of inflation existed, together with a drastic scarcity of dollar exchange.

CONISTON RESERVOIR POLLUTED

MOBILE tanks took drinking water to Coniston Cold and Bell Busk (Malhamdale) last week when it was established that the water in Coniston Cold reservoir had become polluted with a chemical which leaked into the River Aire from a defective storage tank at a factory during the week-end. The Skipton RDC water engineer, Mr. T. Yeadon, said later that "although the reservoir water tasted and smelled of disinfectant it was quite safe to drink. Samples had been examined, and the chemical content was not injurious to human beings." After inspection of the river between Airton and Gargrave, Mr. J. Sheard, district inspector of the West Riding Rivers Board, said that every fish and all other forms of life in this four-mile stretch had perished.

Home News Items

Closing Date, B.I.F.—A notice from the Board of Trade reminds intending exhibitors that applications for space at the 1949 B.I.F. must be made before August 8. Last year 600 late applications were refused.

Cost of N.H.S.—Contributions to the National Health Service is costing the Dunlop Rubber Company an extra £100,000 a year for its employees in the United Kingdom.

New Rayon Factory.—The Dunlop Cotton Company is opening a factory at Bidston, near Birkenhead, where a new building is nearing completion for the manufacture of rayon fabric for tyres or belting. To start production quickly, machinery will probably be transferred from the firm's Rochdale mills

New Steel Works in Flintshire.—The preparation of a 100-acre site at Shotton for the erection of a new steel works for John Summers & Sons, Ltd., has now been completed and construction will begin shortly. New steel output records have recently been created by the firm's existing plants at Shotton and Shelton.

Record Shipment of Explosives.—A record shipment of gelignite and powder left the Mersey last week bound for West Africa and India for commercial use. The explosives arrived at Liverpool from Scotland in three coastal steamers and were transferred to five ocean-going vessels under the supervision of the City Police, Explosives and Fire Departments.

K.I.D. Exemption.—Cellulose acetate of a special grade, paranitrophenol and sodium paranitrophenol are exempted from key industry duty from July 15 to August 19, 1948, under a new order made by the Treasury. The acetyl content of the cellulose acetate must be at least 55½ per cent. The exemption does not apply to composite goods containing it.

Northwood Athletic Meeting.—More than 400 competitors took part in the I.C.I. (Alkali) annual athletic meeting at Northwich last Saturday. In the four open events—mile relay, quarter mile and 120-yard hurdles, one mile flat—competitors from many well-known Northern clubs were engaged, including front-rank men from Sale Harriers, Bury A.C., Salford and Stockport Harriers. The half-mile relay was won by Fleetwood Works, and the division staff was second.

I.C.I. Hostel.—I.C.I., Ltd., has bought, for £4000, a mansion overlooking Bower Fold football ground, Mottram Road, Stalybridge, which will be converted into a well-appointed hostel for staff and guests.

Paisley Labour Dispute.—After about 800 process workers at three starch works in Paisley had struck work over a dispute concerning payment for shift work, a meeting of the strikers on Friday afternoon (July 16) decided, by a large majority, to stay out.

Strike at Lancs AER Station.—Nearly 150 electricians on constructional work at the Ministry of Supply Atomic Energy Research Establishment at Salwick, near Preston, went on strike on July 12. The dispute, which was over redundancy of 18 employees, was settled the next day.

Liverpool as Streptomycin Centre?—Officials of the Distillers' Company said last week that plans for the commercial production of streptomycin at the firm's Speke (Liverpool) factory were going ahead, but manufacture was "still in the development stage" and it would be some time before quantity production began.

Coal Output Rises.—Provisional coal production figures for last week, 3,968,200 tons (3,731,800 from deep mines, 236,400 from opencast), is an improvement of 100,000 tons on the previous week, and 272,000 tons on the same period a year ago. The net increase in colliery workers during the second quarter of the year was only 1800 compared with 11,500 in the corresponding period of 1947.

Export Licence Section Moves.—As from August 3, the section of the Board of Trade Export Licensing Branch operating from 4 Fenchurch Avenue, will be removed to Regis House, King William Street, London, E.C.4. Telephone: Avenue 3111. The headquarters of the branch will remain at Stafford House, King William Street, London, E.C.4.

Air Conditioning and Engineering.—A merger has been effected by Page & Rundle, Ltd., air conditioning engineers, and Air Conditioning and Engineering (N.I.), Ltd., and both companies will operate under the latter title, with head office and works in Northern Ireland and three London offices, including a Sales and Technical office at 3 Bayley Street, W.C.1.

Personal

Straw Utilisation Appointment

PROF. SOLLY ZUCKERMAN, 43-year-old scientist, who played an important part during the war in measures to mitigate the effects of bombing, is head of a committee set up by the Government to seek uses for waste straw. The chief problem will be to find the best use, other than ploughing back, for the 75,000 tons of linseed straw and an even greater amount of cereal straw which will be left in the fields after the harvest is gathered.

Mr. William M. Rand, president of the Monsanto Chemical Company, St. Louis, Missouri, announced this week the election of MR. ARNOLD H. SMITH as president of Monsanto (Canada), Ltd., Montreal. A native of Akron, Ohio, Mr. Smith had been elected a vice-president and member of the board of directors of the Canadian company on January 1, 1948. Previously he was acting managing director of Monsanto (Australia) Pty., Ltd., and before his Australian assignment, which began in December, 1946, he served as director of Monsanto's foreign department. He has been with the company since 1922.

DR. EDWARD CONDON is to take up again his work at the U.S. National Bureau of Standards, of which he is a director, having been exonerated by American Atomic Energy Commission; he had been denounced by the House Committee on un-American activities.

TEXTILE CONTAMINATION RESEARCH

AN official at Shirley Institute, Manchester, the cotton industry's central research station, said last week that a special department of the institute was investigating the soiling tendency of fabrics. Experiments, he added, were at present in their infancy, but first results were promising.

One aspect of the soiling problem now being tackled by Britain's textile technologists was of atmospheric contamination. By checking the chemical nature of the dirt dispersed in a particular atmosphere they hoped to provide a choice of fibre fabric, or protective treament specially suited to resist that particular form of dirt. Thus, people in one area might be recommended to wear and use certain types of fabric because of their local dirt-resisting qualities, while people in another area might be urged to wear other types.

Thermosetting Resins

U.S. Report on German Synthetics

THE Office of Technical Services of the U.S. Department of Commerce has recently published a report by Mr. Richard D. Dunlop of the Monsanto Chemical Company, Springfield, Ma., describing German manufacture of phenol and formaldehyde resins for use in thermosetting moulding compositions and laminates, surface coatings, adhesives, and ion exchangers.

The report states that the German and American applications of these resins are very similar but lists several new German processes, including the development of a bearing utilising a phenolic moulding composition in place of balls or rollers, and a method of injecting this plastic into the bearings. In addition research had been carried out in the use of air-drying, oil-free phenolic coatings for wood and the production of plasticised, but oil-free phenolic coating resins through the utilisation of the reaction (butylation) of butyl alcohol and phenol methylol compounds.

I.G. Farben Not Dominant

Mr. Dunlop states that I.G. Farbenindustrie held an important place in Germany's pre-war phenolic resin industry but did not dominate it. Several other producers were larger and utilised "natural" phenols obtained from coal distillation, an industry in which I.G. Farbenindustrie was not prominent. The breakdown of the industry into a relatively large group of independent producers led to strong competition and this resulted in emphasis on quality control and lower production costs.

Germany's pre-war attempt to attain self sufficiency also led to some novel developments, including the production of an oil-free plasticised phenolic coating composition to overcome the shortage of oil. During the war, however, there were few developments of any significance.

The first part of the report summarises current practices in the German resins industry and discusses moulding powders, laminates, surface coating, and adhesives and bonding resins. The second part contains detailed descriptions of processes and developments of special importance and the final section contains drawings of equipment, composition tables, and a list of German producers. Mimeographed copies of the 75-page report, No. PB-81276, "The Manufacture of Phenol Formaldehyde Resins and Moulding Powders," may be purchased for $2.00 from the Office of Technical Services, Department of Commerce, Washington 25, D.C.

Overseas News Items

Higher Rumanian Oil Output.—The daily average crude oil output in Rumania amounted to 11,091 tons in April, compared with 10,852 tons in the previous month.

New Chilean Copper Plant.—A plant for the utilisation of Chilean copper sulphide is to be built at a cost of 130 million dollars at Chuquicamata.

Aluminium in the British Zone.—The Rheinische Aluminiumwerke at Lippoldshausen near Lünen in the British zone of Germany are to resume production on August 1. Bauxite stocks available are stated to be large enough to make working to full capacity possible for the next two years.

S. American Appointment for German Expert?—According to reports from the Argentine, Prof. Bergins, German fuel expert and inventor of the hydrogenation process which bears his name, has been appointed adviser on the production of synthetic fuels to the Argentine Government.

Atomic Workers' Wages.—A wage grievance which for seven months has threatened to disrupt the work of the 600 organised workers at Canada's Chalk River atomic energy plant has been ended by a Government promise of a general wage increase of 10 cents an hour, retroactive to May 1 last.

German Experts for India.—A team of German chemists will visit India shortly to prepare a scheme for the establishment of a dyestuffs industry in the Damodar Valley area. This was announced at a recent meeting of a specially appointed planning committee held under the chairmanship of Sir J. C. Ghose, Director General of Industries and Supply.

Dutch Chemicals.—According to official Dutch statistics, production index figures for May for the principal sectors of chemical industry were as follows (1938=100, previous month's index in parentheses): Phosphate fertilisers 128 (154), coal tar products 83 (93), ammonium sulphate 14 (13); the latest figure for sulphuric acid, that for April, is 76 (83) and for benzol products 180 (175).

Poland's Cement Exports. — Cement occupies at present the second place in Poland's export trade. Shipments made through the ports of Gdynia and Danzig totalled last year over 222,000 tons; the chief customers were Brazil, with over 83,000 tons, and the U.S.S.R., with almost 80,000 tons. Argentina, South Africa, Mexico and West Africa were other principal importers of Polish cement.

Record Swedish Ore Shipments.—The largest monthly shipment of Swedish iron-ore since the war was registered in April when 733,000 metric tons were sent abroad.

French Chemical Production.—Production index figures for the French chemical industry (1938=100) moved as follows during the first four months of the current year: 122, 131, 134 and 127.

Italian Cement Recovery.—Although 22 Italian cement plants were damaged during the war and three came into Yugoslav possession as a result of the Peace Treaty, the industry is stated to have made a quick recovery. Output rose from about 1.9 million tons in 1946 to 3.45 million tons last year.

U.S.A. Has Record Budget Surplus.—The U.S. Government ended its fiscal year 1948 on June 30, with the largest budget surplus in history. Income exceeded expenditure by 8,419 million dollars. This surplus is $937 million higher than the amount estimated by President Truman last January. This was the second successive surplus after 16 years of deficits.

Philippines Chrome-ore for U.S.A.—The Acoje mines in the Philippines—which contain possibly the largest chrome-ore reserves in the world—have concluded a contract with a firm in Philadelphia for the delivery of 100,000 tons of ore p.a. Post war recovery of chrome-ore mining in the Philippines has been slow because of the lack of capital, but the situation has recently improved as a result of recent action by the U.S. Reconstruction Finance Corporation.

Fertiliser Production in Russian Zone.—The former I.G. Farbenindustrie plant at Merseberg, now under Russian control and re-named A.G. Fuer Mineraldünger, Chemiswerk Leuna, employs 28,000 workers and is the largest fertiliser factory in the Soviet zone of Germany. Last year's output of ammonium phosphate totalled 327,000 tons. In addition to fertilisers, the Leuna works produce hydrogen, methanol, amines and sulphuric acid.

Reviving Saar Iron Works.—The French authorities in the Saar have decided to allow the Neunkirchner Iron Works A.G., Neunkirchen, to resume operations. Before the war, Neunkirchen iron works accounted for about one-quarter of the Saar's iron output. It is hoped to start two of the six blast furnaces in the near future with support of U.S., French and Belgian finance. The present custodian administration will be liquidated.

Parliamentary Topics

Malayan Tin Ore Export Duties.—Mr. L. D. Gammans asked why the export duty on Malayan tin order had been abolished, and whether it would not adversely affect the tin smelting industry of Malaya. Mr. A. Creech Jones, Secretary of State for the Colonies, replied that the export duty had not been abolished. An additional duty on tin ore exports had been abolished, however, though it did not apply where the ore was for smelting in certain British territories. This action had been taken because export duties of that kind were contrary to the General Agreement on Tariffs and Trade, the provisional application of which to the Federation of Malaya had been notified to the secretary-general of UNO. The Minister was satisfied that the advantages of the action outweighed any possible disadvantages.

Inventions Bill—Third Reading.—Moving the third reading of the Development of Inventions Bill, Mr. J. W. Belcher said it was hoped soon to announce the name of the chairman of the National Research Development Corporation, which is to be set up for the purpose of developing and exploiting inventions. He believed that the name would be one which would win universal acceptance and approval. The Bill, said Mr. Belcher, would ensure that no major invention need lie on the laboratory shelves for lack of appreciation of its value or of the finance required to bring it into use.

Foreign Technical Publications.—In an oral answer to Sir W. Smithers, the President of the Board of Trade said he had now arranged that any person may import, either for himself or for others, single postal copies of learned, scientific, technical and religious periodicals, and periodicals printed exclusively in a foreign language. Details would be published shortly.

Agroxone.—Referring to a statement by Lieut.-Col. Clifton-Brown that Agroxone was difficult to obtain in the Eastern Counties, the President of the Board of Trade said that supplies of this selective weed-killer had recently improved and he understood that supplies for farmers could now be fully met through the usual marketing channels.

Steel Subsidies.—Replying to a question on the amount of financial assistance given by the Government to the steel industry, including part-payment of freight charges and cost of overseas purchases, Mr. G. R. Strauss, Minister of Supply, said that the question of withdrawal of subsidies will be reviewed in the autumn.

Technical Publications

A RECENTLY revived German pharmaceutical journal, *Die Pharmazie* (Berlin SW 68, Neue Grünstrasse 18) contained in its March issue, of 115 pp., an article on new contact insecticides of the halogen-hydrocarbons class, by R. Reimscheider and A. Kühl. The starting point of their research, which led to new and very active contact-toxics with aromatic components, was an investigation on non-aromatic cyclic hydrocarbons with high halogenating capacity. In trying to find a synthesis of cantharidine-like compounds, the new insecticide was discovered, an endomethylene-tetrahydrohydrindene, which the authors named M410, in accordnce with its molecular weight. It is said to compete as a non-toxic insecticide with DDT preparations and Gammexane.

* * *

The advantages of switchboard construction of control gear, which departs from the traditional design, in which each motor and its control gear are usually treated as individual components, are fully described in Leaflet No. 469, recently issued by Brookhirst Switchgear, Ltd., Chester. It is pointed out that this method of construction has been widely adopted for controlling the drives of many large material-handling plants in which centralised control, together with subsidiary distribution circuits, is effectively provided in a single unit.

VIBRATION DAMPING

LOCATI and Di Carlo, of the Fiat Research Laboratories, have recently investigated the vibration damping capacities of copper alloyed with varying amounts of zinc, nickel, manganese. (*La Metallurgia italiana*, 1947, *39*, 201-5) in continuation of previous work in the same field reported *loc. cit.* 1940, 1942 and 1945, chiefly with steels. The same methods and apparatus were employed.

The samples comprised (1) copper alloyed with 5, 10 and 30 per cent zinc; (2) copper alloyed with 5, 10 and 30 per cent nickel, and (3) copper alloyed with 5, 10, 15 and 50 per cent manganese; tests were made (a) as cast, and (b) annealed at 300°C. In regard to (3) the copper and manganese sample, reference is made to previous work by Dean and co-workers (*Trans. Am. Soc. for Metals*, June, 1941, 402). The general conclusion is that, while copper with zinc or nickel shows relatively low damping capacities, the alloy containing 50 per cent manganese exhibited higher values and should be of practical interest.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

SILF CO., LTD., London, W., dealers in medicinal preparations. (M., 24/7/48.) June 15, £1500 debenture to P. J. Williams Properties, Ltd.; general charge.

BUKIT PULAI RUBBER ESTATE, LTD., London, E.C. (M., 24/7/48.) June 18, charge to Industrial Rehabilitation Finance Board securing all sums which the chargees may be called upon to pay under or by reason of a guarantee; charged on land at Masai, Johore, known as Bukit Pulai Rubber Estate. *Nil. November 11, 1947.

GEDONG (PERAK) RUBBER ESTATE, LTD., London, E.C. (M., 24/7/48.) June 10, mortgage to Industrial Rehabilitation Finance Board, Malaya, securing all moneys which the mortgagees may be called upon to pay under or by reason of a guarantee; charged on Gedong Estate, Bidor, Perak. *Nil. July 8, 1947.

Satisfactions

YORKSHIRE VARNISH CO., LTD., London, S.W. (M.S., 24/7/48.) Satisfaction June 12, £9000, registered November 4, 1929.

MORRIS RUBBER INDUSTRIES, LTD., Byfleet. (M.S., 24/7/48.) Satisfaction June 18 of debentures registered June 7, 1946.

DEXTER PAINTS, LTD., Burnley. (M.S., 24/7/48.) Satisfaction June 14 of charge registered June 7, 1946.

OMEGA PLASTICS, LTD., London, E.C. (M.S., 24/7/48.) Satisfaction June 15 of mortgage and charge registered June 20, 1946.

GOADSBY & CO., LTD., Manchester, paint manufacturers, etc. (M.S., 24/7/48.) Satisfactions June 17 of mortgages registered October 5, 1916, and December 21, 1921.

Company News

The nominal capital of **Maure Chemicals, Ltd.**, 34 Hoxton Square, N.1, has been increased by £900, in £1 ordinary shares, beyond the registered capital of £100.

The nominal capital of **Organic Dyestuffs, Ltd.**, Croft Street, Pendleton, has been increased by £9000, in 1000 ordinary and 8000 preference shares of £1 each, beyond the registered capital of £1000.

Murex, Ltd., reports a net profit of £215,000 for the 10-month period ended April 30 last, as against earnings of £159,000 for the previous twelve months. An ordinary dividend of 20 per cent is being paid.

The nominal capital of **H. Russell (Soaps and Disinfectants), Ltd.**, Ashcroft Road, Kirkby Trading Estate, near Liverpool, has been increased by £9700, in 4700 ordinary and 5000 preference shares of £1 each, beyond the registered capital of £300.

Imperial Chemical Industries, Ltd., has decided to issue 10,093,023 new ordinary shares of £1 each at 40s. 6d. per share and to offer them to the ordinary stockholders in the proportion of one new ordinary share for each £5 of ordinary stock held. Fractions of new shares will be disregarded. No increase in the company's authorised capital is needed for this issue. Preference and ordinary stockholders may apply for any balance of new ordinary shares which may remain after ordinary stockholders have been satisfied. A circular letter offering the new ordinary shares, and a provisional allotment letter and an application form for "excess shares," will be sent to stockholders on August 18.

New Companies Registered

Langtons (Chemists), Ltd. (456,652).—Private company. Capital £1000. Manufacturing and analytical chemists, etc. S. Langton is the first director. Solicitors: Linder Myers & Pariser, 7 Brazennose Street, Manchester.

Duncan, Flockhart & Co., Ltd.—Private company. Capital £130,000. Manufacturers of pharmaceutical, medicinal and chemical preparations, etc. Directors: H. J. Baker, H. G. Baker, R. L. Kirkcaldie and W. J. Gray, 104 Holyrood Road, Edinburgh.

T. & J. Gover, Ltd. (456,512).—Private company. Capital £5000. Consulting, manufacturing and general chemists, etc. Directors: Thos. R. Gover and Joan P. Gover, and Harold M. Sampson. Reg. office: 10 Walton Street, Walton-on-the-Hill, Surrey.

Super Adhesives, Ltd. (456,071).—Private company. Capital £1000. Manufacturers of glues, glue stocks, gum, pastes, adhesives, etc. Directors: J. W. Lindekvist, B. S. Sadler, Mary J. Vernon, J. E. Evans and Lily Turner. Secretary: J. W. Lindekvist. Registered office: Lancaster Works, Camden Drive, Birmingham 1.

Chemical and Allied Stocks and Shares

THE Berlin news kept stock markets dull and inactive with British Funds moving moderately lower, and industrial shares reflecting absence of buying. There was again no heavy selling, but the coal price decisions and the prospect of higher cost of electricity, were among factors emphasising the likelihood of lower profit margins for many industries.

Under the terms of the big Imperial Chemical issue (*see* "Company News") and at the current price of 44s. 3d. for the old shares at the time of writing, the "rights" are worth 7½d. per share. Both ordinary and preference shareholders will be able to apply for any balance of new shares remaining after the ordinary stockholders' rights have been satisfied. The directors confidently expect that the company's present rates of earnings and dividends will be maintained in the future on the increased capital. At the current price of the shares, the yield works out at £4 18s. 9d per cent on the basis of last year's 10 per cent dividend.

Monsanto Chemicals 5s. shares were 57s. 9d., B. Laporte 5s. ordinary have continued to change hands around 20s., and Fisons were again 57s. 6d. In other directions, British Aluminium have been steady at 47s. 6d., Borax Consolidated were 57s. 6d., but fears that the London Metal Exchange may not be re-opened until next year led to a little selling of Amalgamated Metal shares, which eased to 19s. Elsewhere, British Glues and Chemicals 4s. ordinary have been steadier at 19s., awaiting the dividend. Turner & Newall were 73s. 6d., United Molasses receded to 45s. 3d., and British Oxygen were 94s. 4½d., while there was a sharp decline to 36s. 3d. in De La Rue. Lever & Unilever eased to 46s.

Iron and steel shares lost ground with the general trend, the generous yields failing to attract buyers although there is every reason to expect dividends to be maintained, and the view persists that in any case, nationalisation cannot be effected until 1950. Dorman Long were 29s. 4½d., United Steel 27s. 6d., Colvilles 33s., and Stewarts & Lloyds 51s. 4½d. The assumption prevails in the City that the Government's nationalisation plans are likely to be confined to companies actually engaged in iron and steel production; because it would be impossible to include all the varied activities of the iron and steel industry without making the measure much too complicated, arousing very widespread opposition and dislocating industry.

Boots Drug 5s. ordinary units have eased to 47s. 3d. with the general trend of markets, and British Drug Houses 5s. shares changed hands around 7s. 9d. Glaxo Laboratories came back to £14¾, Sangers 5s. ordinary were 29s. 4½d., and Beechams deferred 18s. 9d. Elsewhere, Triplex Glass 10s. ordinary eased to 22s. 6d. Associated Cement came back to 71s. 6d. following their recent rally, and British Plaster Board were 23s. although there is a yield of 5¼ per cent on the basis of last year's 25 per cent dividend. Oil shares have weakened on the fear that some of the Arab countries might decide to cancel oil concessions, although the prevailing belief is that any drastic step of this kind is unlikely. Anglo-Iranian have fallen to £7⅛, and Shell to 73s. 9d., while shares of companies operating in areas unaffected by uncertainties of the Palestine news were also lower, including Trinidad Leaseholds at 30s. 3d., and V.O.C. at £5 13/32.

British Chemical Prices

Market Reports

STEADY trading conditions have again been reported on the chemical market and contract delivery specifications have covered good quantities. A steady volume of export business is also reported, and the overall supply position, if not showing any marked improvement, is perhaps a little better than during the earlier months of the year. In the soda products section there has been a good demand for chlorate, bichromate and yellow prussiate of soda. Hyposulphite of soda is firm on a steady call and a ready outlet awaits available supplies of soda ash. There have been no changes in the potash products, which are in strong request on a firm price basis. The lead oxides are in active request and values remain at recent levels. The coal tar products market is unchanged and without special feature. Prices are steady.

MANCHESTER.—A steady call for supplies of the general run of textile chemicals for the Lancashire cotton trade has been reported on the Manchester market during the past week, the movement of supplies having been affected only slightly by holiday stoppages. The demand for other outlets has also been on steady lines and aggregate quantities of the alkalis and the ammonia and other compounds being absorbed are substantial. A fair amount of additional home and export business has been placed. The fertiliser market is on the quiet side, as is usual at this time of the year, but activity in most of the tar products continues.

Patent Processes in Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of specifications accepted will be obtainable, as soon as printing arrangements permit, from the Patent Office, Southampton Buildings, London, W.C.2, at 1s. each. Higher priced photostat copies are generally available.

Complete Specifications Accepted

Means for conducting gaseous streams to a gas cutting nozzle.—British Oxygen Co., Ltd., and R. C. Godfrey. Nov. 19, 1945. 603,969.

Treatment of chromium ores.—H. W. K. Jennings. (Hudson Bay Mining & Smelting Co., Ltd.) Nov. 19, 1945. 603,973.

Manufacture of shaped articles of regenerated cellulose produced from viscose.—British Cellophane, Ltd. Nov. 23, 1944. 603,974.

Presses for the extrusion of lead and lead alloys.—British Insulated Callender's Cables, Ltd., H. Hill, and S. Beckinsale. Nov. 29, 1945. 603,986.

Production of a preparation containing lactic-acid bacteria. A/S Maelkeriet Enigheden. May 19, 1941. 604,005.

Stabilised n-vinyl pyrrole compounds and process of producing the same.—General Aniline & Film Corporation. Nov. 30, 1944. 604,011.

Manufacture of amidines.—Boots Pure Drug Co., Ltd., W. F. Short, M. W. Partridge, and P. Oxley. Nov. 21, 1945. 604,032.

Melting furnaces.—H. G. C. Fairweather, (National Smelting Co.) Nov. 21, 1945. 604,033.

Manufacture of porous metal.—Sintered Products, Ltd., and J. W. Lennox. Nov. 21, 1945. 603,762.

Bleaching of ground wood pulp.—Buffalo Electro-Chemical Co., Inc. Jan. 10, 1945. 604,050.

Ammonium nitrate detonating explosives.—I.C.I., Ltd., J. C. Hornel, and O. A. Gurton. Nov. 23, 1945. 604,072.

Manufacture of highly polymeric linear esters and the production of filaments, fibres and the like therefrom.—I.C.I., Ltd., J. G. Cook, H. P. W. Huggill, and A. R. Lowe. Nov. 23, 1945. 604,073.

Manufacture of highly polymeric linear esters and the production of filaments, fibres and the like therefrom.—I.C.I., Ltd., J. G. Cook, J. T. Dickson, H. P. W. Huggill, and A. R. Lowe. Nov. 23, 1945. 604,074.

Manufacture of highly polymeric linear esters and the production of filaments, fibres and the like therefrom.—I.C.I., Ltd., and A. R. Lowe. Nov. 23, 1945. 604,075.

Manufacture of preforms of synthetic resinous materials.—Bakelite, Ltd. Nov. 25, 1944. 604,079.

Processes for manufacturing synthetic resin.—Soc. Generale des Huiles de Petrole. Jan. 19, 1945. 603,825.

Production of aliphatic acid anhydrides.—C. G. Bonard. (Legal representative of H. Dreyfus (deceased).) Oct. 3, 1941. 604,269.

Process for reducing the viscosity of or for liquefying mucus and preparations for use therein.—A. Kraus. Feb. 28, 1944. 604,350.

Manufacture of optical elements from polymerisable material.—International Polaroid Corporation. April 16, 1943. 604,274.

Glasses containing potassium phosphate and silicate.—Hall Laboratories, Inc. April 15, 1943. 604,189.

Manufacture of sulphuric acid esters.—J. R. Geigy, A.G. May 12, 1943. 604,351.

Liquid filtration.—Fram Corporation. July 10, 1943. 604,110.

Superphosphates.—I.C.I., Ltd., R. G. Franklin, and C. R. Bury. Sept. 8, 1944. 604,119.

Method of drawing wire.—H. A. Montgomery. Sept. 15, 1944. 604,353.

Method of increasing the germicidal properties of phenol germicides and products of such method.—A. J. Salle, and H. L. Guest. Oct. 9, 1944. 604,277.

Detonators for initiating the detonation of explosive charges under the surface of a liquid.—I.C.I., Ltd., E. Jones, and C. R. L. Hall. Oct. 17, 1944. 604,124.

Catalytic alkylation of isoparaffins and olefins—J. C. Arnold. (Standard Oil Development Co.) Oct. 27, 1944. 604,278.

Process for hydrocarbon conversion.—Phillips Petroleum Co. Feb. 6, 1942. 604,432.

Production of substituted arylamino acridine derivatives.—Ward, Blenkinsop & Co., Ltd., A. A. Goldberg, and W. Kelly. Nov. 24, 1944. 604,279.

Methods of oxidising relatively long chain unsaturated fatty bodies.—Emery Industries., Inc. Jan. 20, 1944. 604,281.

Process for the manufacture of soap.—Industrial Patents Corporation. Dec. 4, 1943. 604,282.

Process for polymerising esters of unsaturated alcohols.—Shell Development Co. Feb. 1, 1944. 604,284.

Flameproofing of cellulosic and protein textile materials.—J. Bancroft & Sons Co. Dec. 18, 1943. 604,197.

Means for reproducing X-ray images.—Pye, Ltd., and B. J. Edwards. Feb. 26, 1945. 604,198.

Modification of marine animal oils.—W. P. Williams. (Procter & Gamble Co.) Feb. 27, 1945. 604,136.

Self-sustaining flexible films.—Firestone Tire & Rubber Co. Feb. 26, 1944. 604,138.

Photographic elements.—E. I. Du Pont de Nemours & Co. March 16, 1944. 604,440.

Treatment of wool-washing effluent.—Industrial Development Corporation of South Africa, Ltd. Nov. 14, 1944. 604,139.

Production of organic nitrogen compounds.—I.C.I., Ltd., and C. W. Scaife. March 12, 1945. 604,360.

Method for improving the general qualities of rubbers particularly synthetic rubbers.—Usines de Melle. Nov. 12, 1941. 604,361.

Manufacture of monoaryl tertiary amines or salts thereof.—Soc. of Chemical Industry in Basle. March 31, 1944. 604,363.

Plastic compositions based on polyvinyl butyrals.—Soc. des Usines Chimiques Rhone-Poulenc. Dec. 2, 1942. 604,364.

Manufacture of insecticidal compositions.—R. M. Hughes (J. R. Geigy, A.G.) April 11, 1945. 604,443.

Concentration of small fragmentary particles from mixtures thereof.—American Cyanamid Co. April 21, 1944. 604,366.

Process for the preparation of soluble salts of para-aminobenzenesulphonthiourea. Soc. des Usines Chimiques Rhone-Poulenc. May 6, 1944. 604,204.

Anti-back flash welding or heating torch.—Volcan Soc. Anan. June 21, 1943. 604,444.

Vapour vacuum pumps of the double jet type.—P. Alexander, and C. Whiley. April 21, 1945. 604,205.

Vacuum vapour pumps.—P. Alexander and C. Whiley. April 21, 1945. 604,206.

Joining of carbon bodies to other bodies.—C. D. Patents, Ltd., and C. D. Greaves. May 2, 1945. 604,293.

Centrifugal pumps.—Sulzer Frères, Soc. Anon. June 9, 1944. 604,448.

Extreme pressure lubricating oil compositions.—Monsanto Chemical Co. June 17, 1944. 604,370.

Process of preparing stable emulsions of water-insoluble resins or cellulose derivatives.—H. E. Potts. (Shawinigan Chemicals, Ltd.) June 25, 1945. 604,371.

Manufacture of combinations of agents for combating vermin.—J. R. Geigy, A.G. June 13, 1944. 604,212.

Dimethyl silicone elastomers.—British Thomson-Houston Co., Ltd. July 1, 1944. 604,215.

Cyanine dyestuffs and photographic silver halide emulsions sensitised therewith.—Ilford, Ltd., J. D. Kendall, and F. P. Doyle. July 3, 1945. 604,217.

Fertilisers.—I.C.I., Ltd., and R. M. Pearson. July 4, 1945. 604,145.

Production of heat resistant coatings of metal on another metal.—C. F. Lumb. July 5, 1945. 604,457.

Substituted acridines and intermediates therefore, and process of making them.—E. Lilly & Co. July 29, 1944. 604,375.

Coating compositions, and emulsions suitable for preparing coating compositions and other products.—E. Hene. July 30, 1945. 604,299.

Apparatus for producing angular-velocity modulation in a cathode-ray beam.—G. Longo. March 8, 1945. 604,303.

Method of producing hydrogen by converting carbon monoxide with steam.—Magnesium Metal Corporation, Ltd., and A. G. Carter. Aug. 28, 1945. 604,376.

Electron-discharge aparatus.—Standard Telephones & Cables, Ltd. Sept 11, 1944. 604,309.

Phosphatic fertilisers.—I.C.I., Ltd., R. G. Franklin, and C. R. Bury. Sept. 3, 1945. 604,150.

Catalysts for hydrocarbon reactions.—H. W. K. Jennings. Sept. 7, 1945. 604,377.

Heat-exchange devices.—M. G. H. Girodin. March 6, 1944. 604,464.

Centrifugal-compressors.—Sulzer Frères Soc. Anon. Oct. 2, 1944. 604,378.

Stabilised silver halide emulsions.—General Aniline & Film Corporation. Sept. 16, 1944. 604,151.

Dielectric compositions.—C. E. Every. (Titanium Alloy Manufacturing Co.) Oct. 4, 1945. 604,229.

Preservation of preparations of lactobacillus acidophilus.—A.S. Maelkeriet Enigheden. May 19, 1941. 604,381.

Stabilised silver halide emulsions.—General Aniline & Film Corporation. Oct. 6, 1944. 604,153.

Plant for the manufacture of halogenated hydrocarbons.—Solvay & Cie. Nov. 24, 1943. 604,384.

Variable output atomiser.—Soc. Rateau. May 19, 1939. 604,154.

Method of production of liquid organic compounds starting from vegetable materials.—Soc. Pyreneenne de Carburants et Solvants. Oct. 19, 1944. 604,386.

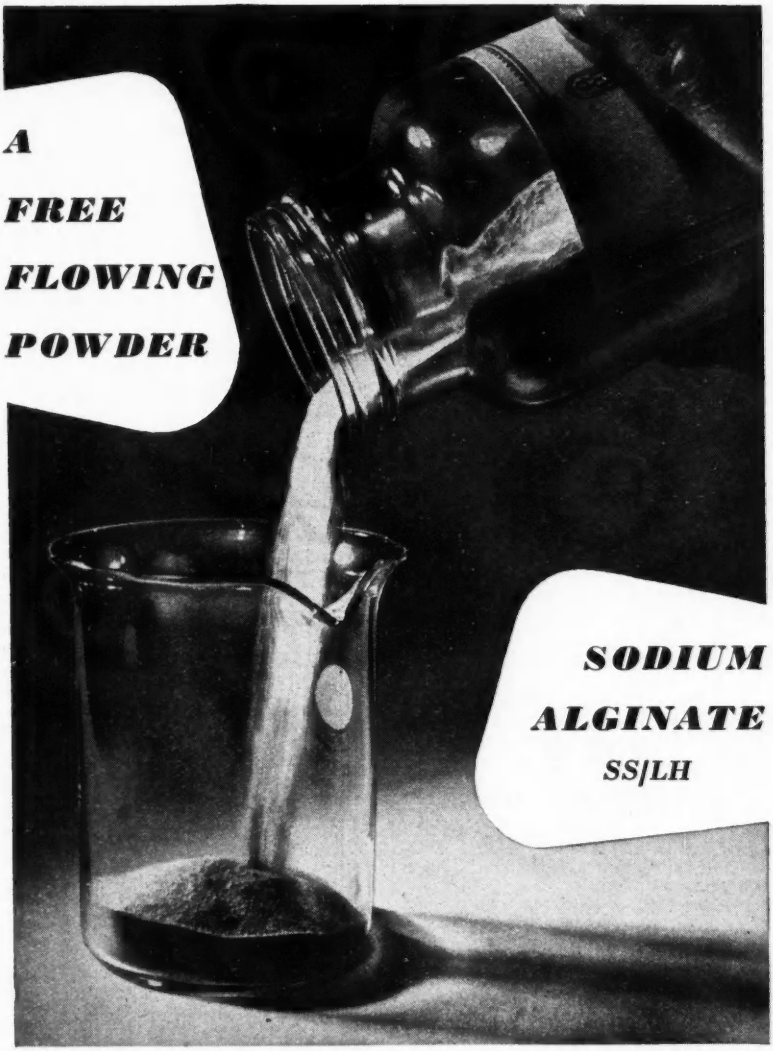
Method of production of liquid condensable organic compounds starting from vegetable materials.—Soc. Pyreneenne de Carburants et Solvants. Oct. 19, 1944. 604,387.

Extreme pressure lubricating oil compositions.—Monsanto Chemical Co. June 17, 1944. 604,388.

Process for the manufacture of threads and the like from polyvinyl chloride.—Soc. Rhodiaceta. May 5, 1942. 604,234.

Process for the granulation of fertilisers.—Soc. Anon. des Manufactures des Glaces et Produits Chimiques de Saint-Gobain, Chauny & Cirey. Nov. 2, 1944. 604,322.

Cracking of hydrocarbons.—H. W. K. Jennings. (Standard Oil Co.) Nov. 2, 1945. 604,395.



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TBW27AL

Process for the manufacture of salts of basically substituted phenyl esters of alkyl carbamic acids.—Allen & Hanburys, Ltd., and C. J. Eastland. Nov. 1, 1945. 604,394.

Production of artificial staple fibre.—British Celanese, Ltd. Nov. 7, 1944. 604,163.

Coating metals with phosphates.—Pyrene Co., Ltd., M. Barent, and S. W. Johnson. Nov. 7, 1945. 604,325.

Process for the manufacture of 7-dehydro-cholesterol and its esters.—A. Lowenbein. Nov. 9, 1945. 604,328.

Synthetic resin coating compositions.—L. Berger & Sons, Ltd., E. J. Ross, and W. J. Smith. Nov. 20, 1945. 604,480.

Machines for shredding and dispensing soap and like substances.—Voorhis-Tiebout Co., Ltd. Sept. 14, 1945. 604,481.

Seals between metal and glass members.—Philips Lamps, Ltd. Aug. 17, 1940. 604,248

Lead azide compositions and detonators containing the same. Imperial Chemical Industries, Ltd., L. Rubinstein, and B. Campbell. Nov. 26, 1945. 604,448.

Power gas generating cartridges. Imperial Chemical Industries, Ltd., E. Whitworth, and T. Thomson. Nov. 26, 1945. 604,489.

Flame-proofing of combustible materials and reagents used in connection therewith. Imperial Chemical Industries, Ltd., A. McLean, and S. F. Marrian. Nov. 26, 1945. 604,490.

3-acylbenzanthrones.—Imperial Chemical Industries, Ltd. F. Irving, and A. W. Johnson. Nov. 26, 1945. 604,491.

Vinyl ethers and polymers thereof.—General Aniline & Film Corporation. Dec. 23, 1944. 604,492.

Insecticidal devices.—Ashton Products, Ltd., and L. Pearson. Nov 27, 1945. 604,336.

Heat exchangers for liquids.—G. F. Austin, and D. G. Wood. Dec. 4, 1945. (Cognate Application 5244/46.) (Addition to 573,998.) 604,174.

Production of anhydrous magnesium chloride and the production of metallic magnesium therefrom.—Washington Chemical Co., Ltd., R. H. Kerlogue, and P. E. Bugge. Dec. 8, 1945. 604,338.

Liquid measuring devices.—Cheecol Processes, Ltd., and E. R. Green. Dec. 14, 1945. 604,176.

Manufacture of 4-aminobenzenesulhponylureas.—Geigy, Akt.-Ges, J. R. (Dec. 28, 1944.)* (Cognate Application 34856/45.) 604,259.

Process for improving the properties of bitumens.—Naamlooze Vennootschap De Bataafsche Petroleum Maatschappij. (May 22, 1943.)* 604,408.

Catalytic averaging of hydrocarbons.—H. W. K. Jennings, (Standard Oil Co.). Jan. 2, 1946. 604,410.

Process for the manufacture of co-polymers from vinyl esters and vinylidene compounds by polymerisation in emulsion.—Naamlooze Vennootschap De Bataafsche Petroleum Maatschappij. (Dec. 10, 1942.)* 604,412.

Combination of apparatuses for heating and applying plastics or materials or high viscosity to pavements for repairing and for marking traffic lanes.—F. Nicholson. April 6, 1946. 604,501.

Venezuelan Oil Output.—Oil production in Venezuela during March reached a new monthly record of 6,480,000 cubic metres, bringing the total for the first quarter of the year to 18,780,000 compared with 16,610,000 cubic metres during the same period in 1947.

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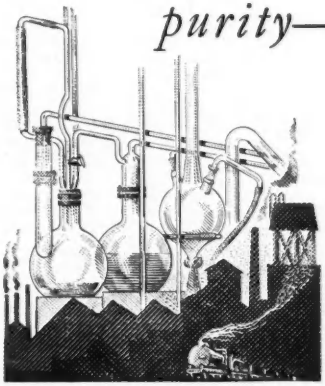

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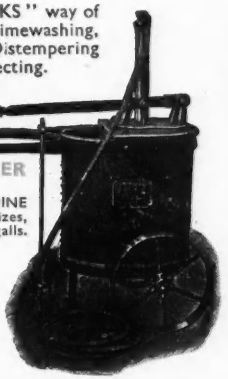


BRIDGEWATER PATTERN SPRAYING MACHINE is made in two sizes, 18 galls. and 30 galls.

Catalogues free

All Prices are subject to conditions prevailing at the time Orders are received.

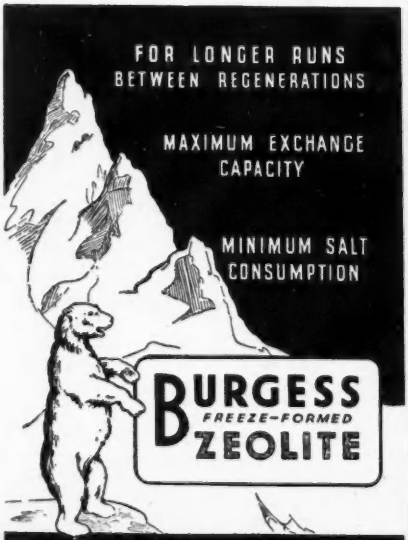
Sole Manufacturers :

The Four Oaks Spraying Machine Co.

Four Oaks Works, Four Oaks, BIRMINGHAM

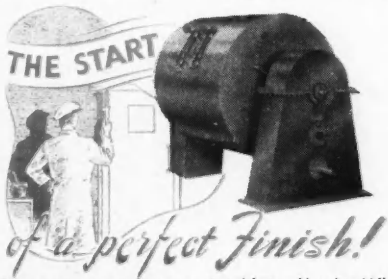
W. C. G. LUDFORD, Proprietor.

Telegrams : "Sprayers, Four Oaks." *Telephone :* 305 Four Oaks.



BURGESS ZEOLITE COMPANY LIMITED

68-72, HORSEFERRY ROAD, WESTMINSTER, S.W.1. Tel: ABBey 1868



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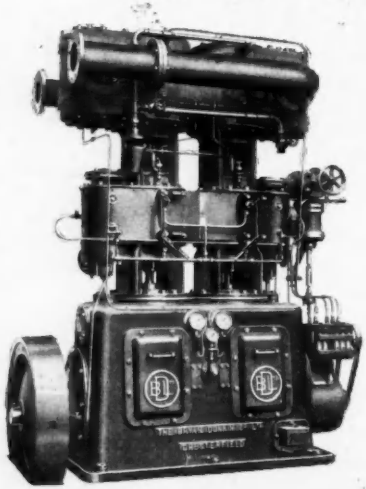

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Easy Accessibility
to Working Parts

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